2.0 APP	PLICABLE UI	IC REGULAT	TORY REQUI	REMENTS

### 2.0 APPLICABLE UIC REGULATORY REQUIREMENTS

Subpart D—Authorization by Permit

§ 144.31 Application for a permit; authorization by permit.

- (e) Information requirements. All applicants for permits shall provide the following information to the Director, using the application form provided by the Director.
- (1) The activities conducted by the applicant which require it to obtain permits under RCRA, UIC, the National Pollution Discharge Elimination system (NPDES) program under the Clean Water Act, or the Prevention of Significant Deterioration (PSD) program under the Clean Air Act.

This information is provided in the process descriptions summarized in Section 1.0 of this document.

(2) Name, mailing address, and location of the facility for which the application is submitted.

This information is provided on the UIC Permit Application Forms that accompany this document in Section 3.0.

(3) Up to four SIC codes which best reflect the principal products or services provided by the facility.

This information is provided on the UIC Permit Application Forms that accompany this document in Section 3.0.

(4) The operator's name, address, telephone number, ownership status, and status as Federal, State, private, public, or other entity.

This information is provided on the UIC Permit Application Forms that accompany this document in Section 3.0.

(5) Whether the facility is located on Indian lands.

This information is provided on the UIC Permit Application Forms that accompany this document in Section 3.0.

- (6) A listing of all permits or construction approvals received or applied for under any of the following programs:
- (i) Hazardous Waste Management program under RCRA.
- (ii) UIC program under SDWA.
- (iii) NPDES program under CWA.
- (iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act.
- (v) Nonattainment program under the Clean Air Act.
- (vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.
- (vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.
- (viii) Dredge and fill permits under section 404 of CWA.
- (ix) Other relevant environmental permits, including State permits.

This information is provided in Table T-1 of this document.

(7) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, and other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within a quarter mile of the facility property boundary.

See Attachments A and B in Section 4.0 of this document. Figure B-1 provides a one mile radius from the facility boundary. Figure B-2 shows that no wells, springs or drinking water wells are located within ¼-mile of the existing or proposed mine backfill repository areas.

(8) A brief description of the nature of the business.

See Attachment U in Section 4.0 of this document.

(9) For EPA-administered programs, the applicant shall identify and submit on a list with the permit application the names and addresses of all owners of record of land within one-quarter mile of the facility boundary. This requirement may be waived by the Regional Administrator where the site is located in a populous area and the Regional Administrator determines that the requirement would be impracticable.

A GIS property ownership search of adjacent landowners within the ¼ mile AOR radius depicted on Figure B-2 was provided to CEC by the Planning and Development Services of Kenton County located at 2332 Royal Drive, Fort Mitchell, Kentucky in January 2015. Table B-1 lists the property owners identified within the AOR.

(10) A plugging and abandonment plan that meets the requirements of §146.10 of this chapter and is acceptable to the Director.								
See Attachment Q in Section 4.0 of this document.								

3.0 UNDERGROUND INJECTION CONTROL PERMIT APPLICATION USEPA FORM 7520-6 (REV. 12-11)

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OMB No. 2040-0042 Approval Expires 11/30/2014 United States Environmental Protection Agency I. EPA ID Number **Underground Injection Control** T/A C **Permit Application** (Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144) Read Attached Instructions Before Starting For Official Use Only Date received Application approved **Permit Number** Well ID FINDS Number mo day vear il. Owner Name and Address III. Operator Name and Address Owner Name Owner Name Carmeuse Lime & Stone Carmeuse Lime & Stone Street Address Phone Number Street Address Phone Number 11 Stanwix Street - 11th Floor (412) 995-5550 9043 Highway 154 (859) 472-8100 ZIP CODE State State ZIP CODE Pittsburgh PA 15222 Butler KY 41006 IV. Commercial Facility V. Ownership VI. Legal Contact VII. SIC Codes Yes Private Owner 3274 No Federal Operator Other VIII. Well Status (Mark "x") **Date Started** B. Modification/Conversion x C. Proposed щο day vear Operating 04/01/1992 IX. Type of Permit Requested (Mark "x" and specify if required) **Number of Existing Wells** Number of Proposed Wells Name(s) of field(s) or project(s) B. Area A. individual Two (2) Four (4) Carmeuse Black River Mine X. Class and Type of Well (see reverse) A. Class(es) C. If class is "other" or type is code 'x,' explain B. Type(s) D. Number of wells per type (If area permit) (enter code(s)) (enter code(s)) Mine backfill Two (2) existing backfill wells, BR#1 (KYV0002) and BR#2 (KYV0003) and four (4) future backfill wells. XI. Location of Well(s) or Approximate Center of Field or Project XII, Indian Lands (Mark 'x') Latitude Lonaltude Township and Range Yes Min Sec Deg Min Sec Range 1/4 Sec **Feet From** Line Feet From Line 50 07 84 14 25 XIII. Attachments (Complete the following questions on a separate sheet(s) and number accordingly; see instructions) For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application. XIV. Certification certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32) A. Name and Title (Type or Print) B. Phone No. (Area Code and No.)

(606) 564-9600

3/2/2015

D. Date Signed

C. Signature

Robert Prystaloski - Director of Operations

### **Well Class and Type Codes**

Class I Wells used to inject waste below the deepest underground source of drinking

water.

Type "I" Nonhazardous industrial disposal well

"M" Nonhazardous municipal disposal well

"W" Hazardous waste disposal well injecting below USDWs"X" Other Class I wells (not included in Type "I," "M," or "W")

Class II Oil and gas production and storage related injection wells.

Type "D" Produced fluid disposal well

"R" Enhanced recovery well

"H" Hydrocarbon storage well (excluding natural gas)

"X" Other Class II wells (not included in Type "D," "R," or "H")

Class III Special process injection wells.

Type "G" Solution mining well

**"S"** Sulfur mining well by Frasch process

"U" Uranium mining well (excluding solution mining of conventional mines)

"X" Other Class III wells (not included in Type "G," "S," or "U")

Other Classes Wells not included in classes above.

Class V wells which may be permitted under §144.12. Wells not currently classified as Class I, II, III, or V.

### **Attachments to Permit Application**

# Class Attachments I new well A, B, C, D, F, H – S, U existing A, B, C, D, F, H – U II new well existing A, B, C, E, G, H, M, Q, R; optional – I, J, K, O, P, U A, E, G, H, M, Q, R, – U; optional – J, K, O, P, Q III new well existing A, B, C, D, F, H, I, J, K, M – S, U A, B, C, D, F, H, J, K, M – U

Other Classes To be specified by the permitting authority

### **INSTRUCTIONS - Underground Injection Control (UIC) Permit Application**

Paperwork Reduction Act: The public reporting and record keeping burden for this collection of information is estimatedo average 224 hours for a Class I hazardous well application, 110 hours for a Class I non-hazardous well application,67 hours for a Class II well application, and 132 hours for a Class III well application. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collectingvalidating, and verifying information, processing and maintaining information, and disclosing andproviding information; adjust the existing ways to comply with any previously applicable instructions and requirements, train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection finformation unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, DC 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

This form must be completed by all owners or operators of Class I, II, and III injection wells and others who may be directed to apply for permit by the Director.

- I. EPA I.D. NUMBER Fill in your EPA Identification Number. If you do not have a number, leave blank.
- II. OWNER NAME AND ADDRESS Name of well, well field or company and address.
- III. OPERATOR NAME AND ADDRESS Name and address of operator of well or well field.
- IV. COMMERCIAL FACILITY Mark the appropriate box to indicate the type of facility.
- **V. OWNERSHIP** Mark the appropriate box to indicate the type of ownership.
- VI. LEGAL CONTACT Mark the appropriate box.
- VII. SIC CODES List at least one and no more than four Standard Industrial Classification (SIC) Codes that best describe the nature of the business in order of priority.
- VIII. WELL STATUS Mark Box A if the well(s) were operating as injection wells on the effective date of the UIC Program for the State. Mark Box B if wells(s) existed on the effective date of the UIC Program for the State but were not utilized for injection. Box C should be marked if the application is for an underground injection project not constructed or not completed by the effective date of the UIC Program for the State.
- IX. TYPE OF PERMIT Mark "Individual" or "Area" to indicate the type of permit desired. Note that area permits are at the discretion of the Director and that wells covered by an area permit must be at one site, under the control of one person and do not inject hazardous waste. If an area permit is requested the number of wells to be included in the permit must be specified and the wells described and identified by location. If the area has a commonly used name, such as the "Jay Field," submit the name in the space provided. In the case of a project or field which crosses State lines, it may be possible to consider an area permit if EPA has jurisdiction in both States. Each such case will be considered individually, if the owner/operator elects to seek an area permit.
- X. CLASS AND TYPE OF WELL Enter in these two positions the Class and type of injection well for which a permit is requested. Use the most pertinent code selected from the list on the reverse side of the application. When selecting type X please explain in the space provided.
- XI. LOCATION OF WELL Enter the latitude and longitude of the existing or proposed well expressed in degrees, minutes, and seconds or the location by township, and range, and section, as required by 40 CFR Part 146. If an area permit is being requested, give the latitude and longitude of the approximate center of the area.
- XII. INDIAN LANDS Place an "X" in the box if any part of the facility is located on Indian lands.
- **XIII. ATTACHMENTS** Note that information requirements vary depending on the injection well class and status. Attachments for Class I, II, III are described on pages 4 and 5 of this document and listed by Class on page 2. Place EPA ID number in the upper right hand corner of each page of the Attachments.
- **CERTIFICATION** All permit applications (except Class II) must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, and by a principal executive or ranking elected official for a public agency. For Class II, the person described above should sign, or a representative duly authorized in writing.

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### **INSTRUCTIONS - Attachments**

Attachments to be submitted with permit application for Class I, II, III and other wells.

- **A. AREA OF REVIEW METHODS** Give the methods and, if appropriate, the calculations used to determine the size of the area of review (fixed radius or equation). The area of review shall be a fixed radius of 1/4 mile from the well bore unless the use of an equation is approved in advance by the Director.
- B. MAPS OF WELL/AREA AND AREA OF REVIEW Submit a topographic map, extending one mile beyond the property boundaries, showing the injection well(s) or project area for which a permit is sought and the applicable area of review. The map must show all intake and discharge structures and all hazardous waste treatment, storage, or disposal facilities. If the application is for an area permit, the map should show the distribution manifold (ifapplicable) applying injection fluid to all wells in the area, including all system monitoring points. Within the area of review, the map must show the following:

### Class I

The number, or name, and location of all producing wells, injection wells, abandoned wells, dryholes, surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features, including residences and roads, and faults, if known or suspected. In addition, the map must identify those wells, springs, other surface water bodies, and drinking water wells located within one quarter mile of the facility property boundary. Only information of public record is required to be included in this map;

### Class II

In addition to requirements for Class I, include pertinent information known to the applicant. This requirement does not apply to existing Class II wells;

### Class III

In addition to requirements for Class I, include public water systems and pertinent information known to the applicant.

C. CORRECTIVE ACTION PLAN AND WELL DATA - Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on all wells within the area of review, including those on the map required in B, which penetrate the proposed injection zone. Such data shall include the following:

### Class I

Adescription of each well's types, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require. In the case of new injection wells, include the corrective action proposed to be taken by the applicant under 40 CFR 144.55.

### Class II

In addition to requirement for Class I, in the case of Class II wellsoperating over the fracture pressure of the injection formation, all known wells within the area of review which penetrate formations affected by the increase in pressure. This requirement does not apply to existing Class II wells.

### Class III

In addition to requirements for Class I, the corrective action proposed under 40 CFR 144.55 for all Class III wells.

D. MAPS AND CROSS SECTION OF USDWs - Submit maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review (both vertical and lateral limits for Class I), their position relative to the injection formation and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection. (Does not apply to Class II wells.)

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- **E. NAME AND DEPTH OF USDWs (CLASS II)** For Class II wells, submit geologic name, and depth to bottom of all underground sources of drinking water which may be affected by the injection.
- F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA Submit maps and cross sections detailing the geologic structure of the local area (including the lithology of injection and confining intervals) and generalized maps and cross sections illustrating the regional geologic setting. (Does not apply to Class II wells.)
- **G. GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES (Class II)** For Class II wells, submit appropriate geological data on the injection zone and confining zones including lithologic description, geological name, thickness, depth and fracture pressure.
- H. OPERATING DATA Submit the following proposed operating data foreach well (including all those to be covered by area permits): (1) average and maximum dailyrate and volume of the fluids to be injected; (2) average and maximum injection pressure; (3) nature of annulus fluid; (4) for Class I wells, source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids; (5) for Class II wells, source and analysis of the physical and chemical characteristics of the injection fluid; (6) for Class III wells, a qualitative analysis and ranges in concentrations of all constituents of injected fluids. If the information is proprietary, maximum concentrations only may be submitted, but all records must be retained.
- FORMATION TESTING PROGRAM Describe the proposed formation testing programFor Class I wells the program must be designed to obtain data on fluid pressure, temperature, fracture pressure, other physical, chemical, and radiological characteristics of the injection matrix and physical and chemical characteristics of the formation fluids.

For Class II wells the testing program must be designed to obtain data on fluid pressure, estimated fracture pressure, physical and chemical characteristics of the injection zone. (Does not apply to existing Class II wells or projects.)

For Class III wells the testing must be designed to obtain data on fluid pressure, fracture pressure, and physical and chemical characteristics of the formation fluids if the formation is naturally water bearing. Only fracture pressure is required if the program formation is not water bearing. (Does not apply to existing Class III wells or projects.)

- J. STIMULATION PROGRAM Outline any proposed stimulation program.
- K. INJECTION PROCEDURES Describe the proposed injection procedures including pump, surge, tank, etc.
- L. CONSTRUCTION PROCEDURES Discuss the construction procedures (according to §146.12 for Class I, §146.22 for Class II, and §146.32 for Class III) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring program, and proposed annulus fluid. (Request and submission of justifying data must be made to use an alternative to packer for Class I.)
- M. CONSTRUCTION DETAILS Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.
- N. CHANGES IN INJECTED FLUID Discuss expected changes in pressure, native fluid displacement, and direction of movement of injection fluid. (Class III wells only.)
- **O. PLANS FOR WELL FAILURES** Outline contingency plans (proposed plans, if any, for Class II) to cope with all shut-ins or wells failures, so as to prevent migration of fluids into any USDW.
- P. MONITORING PROGRAM Discuss the planned monitoring program. This should be thorough, including maps showing the number and location of monitoring wells as appropriate and discussion of monitoring devices, sampling frequency, and parameters measured. If a manifold monitoring program is utilized, pursuant to §146.23(b)(5), describe the program and compare it to individual well monitoring.
- Q. PLUGGING AND ABANDONMENT PLAN Submit a plan for plugging and abandonment of the well including: (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the wellin a state of static equilibrium prior to placement of the plugs. Also for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.

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- **R. NECESSARY RESOURCES** Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug or abandon the well are available.
- S. AQUIFER EXEMPTIONS If an aquifer exemption is requested, submit data necessary to demonstrate that theaquifer meets the following criteria: (1) does not serve as a source of drinking water; (2) cannot now and will not in the future serve as a source of drinking water; and (3) the TDS content of the ground water is more and 3,000 and less than 10,000 mg/l and is not reasonably expected to supply a public water system. Data to demonstrate that the aquifer is expected to be mineral or hydrocarbon production, such as general description of themining zone, analysis of the amenability of the mining zone to the proposed method, and time table for proposed development must also be included. For additional information on aquifer exemptions, see 40 CFR Sections 144.7 and 146.04.
- **T. EXISTING EPA PERMITS** List program and permit number of any existing EPA permits, for example, NPDES, PSD, RCRA, etc.
- **U. DESCRIPTION OF BUSINESS** Give a brief description of the nature of the business.

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4.0 ATTACHMENTS	

### 4.0 ATTACHMENTS

### ATTACHMENT A - AREA OF REVIEW METHODS

The Carmeuse Black River Operation is located near Carntown, Kentucky along the Ohio River as depicted on Figure A-1. This Permit Application is utilizing an area of review (AOR) requested by USEPA Region 4 to consist of one quarter (1/4) mile from the future mine backfill repository areas at the Black River mine operations as seen in Figure B-2.

### ATTACHMENT B - MAPS OF WELLS AND AREA OF REVIEW

The Kentucky Geologic Survey (KGS) website provides a quick link to the Kentucky Geologic Map Information Service on-line database and viewer map at http://kgs.uky.edu/kgsmap/kgsgeoserver/viewer.asp, which was accessed to provide the locations of oil, gas and water wells, in the site vicinity. Figure B-1 is a topographic map which identifies existing UIC injection wells, oil or gas wells, water wells, surface water bodies, springs, and other pertinent surface features. The on-line geologic map indicates that there are no drinking water wells or springs identified within the \( \frac{1}{4} \) mile AOR from the future mine backfill repository areas as shown on Figure B-2. The KGS on-line database includes one oil and gas well permit. This mine penetration is the Wash Plant Return Water conduit that is used to return backfill slurry decant water back to the surface for re-use. On-line information for this well is provided in Table B-2.

### ATTACHMENT C - CORRECTIVE ACTION PLAN AND WELL DATA

No wells within the area of review are known to require corrective action. Corrective action is defined by 40 CFR 144.55, as "For such wells which are improperly sealed, completed, or abandoned, the applicant shall also submit a plan consisting of such steps or modifications as are necessary to prevent movement of fluid into underground sources of drinking water ("corrective actions")". The method of storing limestone fines and kiln dust slurries in the Black River Operation deep mine will not create injection pressures, thus, there is no potential for the injectate slurry to migrate into underground sources of drinking water. Additionally, the storage method utilizes the natural settlement of the limestone fines and kiln dust out of the slurry with no injection procedures involved. Water mixing and pumping is merely used to economically transport the material from the surface to the mine storage area.

### ATTACHMENT D - MAPS AND CROSS SECTION OF USDWs

Figure D-1 shows the availability of groundwater resources in Pendleton County, Kentucky. The depth of the underground mine workings, that is the repository for the injection wells, is below the lowermost Underground Source of Drinking Water (USDW). The USDW for the area of

review is primarily the Ohio River alluvium and its tributary stream alluvium. The Ohio River alluvium is capable of producing significant quantities of water, but the tributary alluvium is too thin and fine grained and produces minimal quantities of water. Both alluvium systems are relatively shallow sources of drinking water. There are no known locations of water wells, springs, or surface water bodies in the site vicinity, with the exception of the Ohio River, as depicted on Figure B-2.

Meager amounts of water may also be obtained from wells drilled into the shallow bedrock in the AOR. The Fresh-Saline Interface map is included as Figure D-2. The Black River mine is at an elevation 145 feet below mean sea level. The fresh-saline water interface is at approximately 400 feet above mean sea level. Therefore, the Black River mine is approximately 545 feet below the fresh-saline water interface. The Black River mine repository is well below any USDW and well below the fresh – saline water interface.

### ATTACHMENT E - NAME AND DEPTH OF USDWs (Class II wells only)

This attachment is not applicable for this Class V Permit Application.

# ATTACHMENT F - MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA

The surficial geology of Pendleton County, Kentucky consists of consolidated sedimentary rocks ranging in age from Ordovician to Silurian and unconsolidated sediments of Quaternary Age. Figure F-1 is a surficial geologic map of Pendleton County, Kentucky. Figure F-2 presents the stratigraphic position of the Black River Mine in the Camp Nelson Limestone, which is approximately 650 feet below ground surface or 145 feet below mean sea level. Above the Camp Nelson Limestone are two confining units, the Oregon Dolomite and the Tyrone Limestone. Combined thickness of these formations is approximately 135 feet. Also known as the High Bridge Group, the Tyrone, Oregon, Camp Nelson, and Wells Creek Formations are structurally positioned on the east flank of the Cincinnati Arch.

The Camp Nelson Limestone is approximately 300 to 350 feet thick consisting of micrite limestone and dolomicrite. The lower 90 feet is dominantly a tan, mottled dolomicrite that was extensively burrowed by organisms (such as worms) giving it a characteristic mottled appearance. These burrows, in which the original lime muds have been disturbed by the organisms before lithification of the sediments, are zones of greater porosity in which the original sediments have been subjected to partial alteration from limestone to dolomite.

A sharp contact exists between the micritic and argillaceous micritic limestone of the Camp Nelson and the crystalline dolomite of the Oregon Formation. The Oregon Formation is characterized by a jigsaw-like texture due to geometrically patterned grey streaks separating angular to subangular areas of tan dolomite. The massive dolomites of the Oregon Formation are gradational upwards into the Tyrone Limestone. The Tyrone Formation consists of micrite, dolomitic micrite and argillaceous micrite. These lithologies are commonly wavy bedded, with local "birds-eye" structures (flat pebbles conglomerate beds) with four to five interbedded thin bentonitic shales up to 1.5 feet thick. The contact between the Tyrone Limestone and the overlying Lexington Limestone is one of the best defined stratigraphic boundaries in the site vicinity. The contact is marked by the occurrence of the uppermost bentonite bed, which separates the micritic Tyrone Limestone from the fossiliferous, crystalline limestone of the Lexington Formation. The massive formations, Oregon and Tyrone, are considered to inhibit vertical groundwater flow.

The Kentucky Geologic Survey website provides a quick link to the Kentucky Geologic Map Information Service on-line database and viewer at map http://kgs.uky.edu/kgsmap/kgsgeoserver/viewer.asp, which was accessed to provide structural geologic information in the site vicinity. A downloaded image of the on-line geologic map of the Carmeuse Black River deep mine area is provided in Appendix F. Structural contours shown on the geologic map indicate that the structural dip in the site vicinity appears to be less than 1 percent to the east. The on-line geologic map also indicates that there are no known faults in the vicinity of the Carmeuse Black River facility. The nearest known faults are located more than 30 miles to the south and southeast of the site.

# ATTACHMENT G - GEOLOGIC DATA ON INJECTION AND CONFINING ZONES (Class II wells only)

This attachment is not applicable for this Class V Permit Application

### ATTACHMENT H - OPERATING DATA

Carmeuse monitors slurry pump motor horse power draw, mix tank slurry level and a flowmeter located downstream of the slurry pump to determine the quantities of slurry pumped to the deep mine repositories.

### **Slurry Transport Rate and Volume:**

### Black River Well #1(EPA ID # KYV0002)

• Average Injection Rate: 3.4 million gallons per month

• Maximum Injection Rate: 8 million gallons per month

### Black River Well #2 (EPA ID # KYV003)

• Average Injection Rate: 3.4 million gallons per month

• Maximum Injection Rate: 4.3 million gallons per month

### **Injection Pressure:**

Slurry is pumped top the wellhead and from that point free falls down the well. Hydraulic head in the injection tubing is used to counteract frictional forces between the slurry and the injection tubing walls to deposit the slurry at the desired location within the mine. The discharge point is open to the mine atmosphere and does not cause back pressure on the injecting tubing. No pressure is induced by the slurry pumps on the injection tubing below the wellhead elevation.

### **Annulus Fluid:**

There is no annulus fluid in the injection wells. The well has an annulus that is open to the atmosphere between the cemented casing and the injections tubing.

### **Injection Fluid:**

The injection fluid is slurry comprised of recycled water, freshwater, limestone fines, and kiln dust. Chemically the injection fluid is comprised primarily of calcium carbonate (CaCO3) and water, with small amounts of other materials. A summary of laboratory analytical data for the injection fluids is presented in Table H-1.

The limestone fines are produced in the crushing and screening operation. The fines are too small in particle size to be sold as aggregate or calcined in the kilns. The limestone fines are mixed with water at the wet screening station to form a slurry and injected through the well for disposal into the mine.

### **Inspection Reporting:**

The most recent UIC compliance inspection report was submitted to USEPA on December 23, 2008.

### ATTACHMENT I - FORMATION TESTING PROGRAM

The limestone fines slurry will be pumped into the worked-out areas of the Black River Operation deep mine. The slurry mix will be transported to the repository areas under gravitational conditions. There are no injection pressures associated with the proposed deep mine repositories.

The mining horizon for the Black River deep mine is in the Camp Nelson Limestone Formation. A detailed evaluation of the in-situ strength of the mining horizon was completed by Summit

Engineering in November 2005. Their analysis included laboratory testing of grab samples of the Camp Nelson Limestone. The laboratory results indicated the following results related to the strength of the limestone:

### <u>Uniaxial Compressive Strength Test Summary (from Summit Engineering report)</u>

Axial Average: 20,161 lb/in²
 Std. Deviation: 5,640 lb/in²
 Transverse Average: 16,769 lb/in²
 Std. Deviation: 4,917 lb/in²

The Summit report concludes that the pillar configuration in the Black River deep mine provides a safety factor in excess of the 2.00 threshold for long term stability. Using a slurry composition of 3:1 (25 percent solids by weight), the resulting slurry density is 87 lb/ft3. At a depth of 930 feet (ground surface to mine floor) if the injection tubing were full of slurry, a maximum pressure of 560 pounds per square inch (psi) would exist in the injection tubing, which is less than 4 percent of the average transverse compressive strength of the rock.

Limestone fines and kiln dust disposal will consist of slurry deposition into mined-out portions of the underground mine workings. As the slurry is deposited, the slurry water decant is returned to the surface for re-use in the slurry mixing process. Therefore, there is no potential to induce hydraulic pressure on the walls, floor or roof of the mine workings.

The confining strata above the Black River Operation deep mine workings are the Oregon Dolomite and the Tyrone Limestone, which are described in Attachments D and F.

### ATTACHMENT J - STIMULATION PROGRAM

A stimulation program is not necessary for the placement of the slurry into the Black River Operation deep mine. The limestone fines and kiln dust slurry is pumped into the worked-out areas of the Black River Operation deep mine. The slurry mix is transported to the repository areas under gravitational conditions. There are no injection pressures associated with the proposed deep mine repositories.

### ATTACHMENT K - INJECTION PROCEDURES

The Carmeuse Black River slurry mixing and circulation process and injection procedures are illustrated in Figure K-1. Surface storage of the limestone fines and kiln dust at the Carmeuse facility is limited to what is practical for the slurry system operation and transportation

requirements. The surface storage will also allow for planned and unplanned maintenance of the slurry system and piping without interfering with the slurry transportation process.

The mixing system for limestone fines and kiln dust is provided on Figure K-1. The mix ratios are approximately 3:1 to 5:1 water to limestone fines or kiln dust mixtures. The mixed slurry is pumped to the injection well while another batch is being mixed. Slurry transport above ground uses Ultra-High Molecular Weight (UHMW) polyethylene pipe.

The slurry is transported through pipelines from the repository well to one of the repository sites in the mine identified in Figure K-2. UHMW polyethylene pipe is used for the pipeline system in the deep mine. Once the slurry reaches the repository site, the material freely discharges from the pipeline into the repository where the limestone fines or kiln dust material will settle out of the slurry and the water will decant for reuse in the slurry process.

The UIC system is a relatively closed-loop system. Water used to make up the slurry mixture is returned to the surface for reuse as it decants from the repository mine workings. Water is periodically be added to the system, as not all of the water will decant from the repository area.

<u>Injection Operation Monitoring</u>: The permittee monitors the operation of the repository wells as follows:

### Parameter Monitoring Frequency

Injection Pressure (psig) at wellhead Monthly, Reported Annually

Flow Rate (M gals/day) of Injected Fluid Daily

Cumulative Volume of Injected Fluid Monthly, Reported Annually

<u>Slurry Transport Fluid Analysis</u>: Carmeuse will conduct periodic transport slurry analysis at least once per year. The analysis will include:

- 1. pH, total dissolved solids
- 2. Sulfate, Safe Drinking Water Act Health Advisory & Primary Drinking Water Standards. Other physical and chemical characteristics of the gypsum slurry as required by the USEPA.

<u>Mine Working Storage Areas</u>: Carmeuse monitors the filling of the slurry repository areas identified on Figure K-2 weekly and advances fill zone piping to properly distribute the limestone fines and kiln dust slurry.

<u>Operational Systems Data</u>: Carmeuse monitors slurry pump motor horse power draw, mix tank slurry level and a flowmeter located downstream of the slurry pump to determine the quantities of slurry pumped to the deep mine repositories.

**Open Air Annulus and Slurry Pipe:** Carmeuse will visually monitor the condition of the open air annulus and borehole slurry pipe from the deep mine on a weekly basis. Appropriate action will be taken based on the suspected source of the leakage, as described in Attachment O of this permit application.

### ATTACHMENT L - CONSTRUCTION PROCEDURES

Repository wells are constructed using steel casing that and is grouted in place and seals the penetrated rock formations, including the shallow water-bearing units that comprise the USDW. The open air annulus between the outer steel casing and the injection tube creates an inward hydraulic gradient, that further protects the USDW if the injection tube were to leak. Additional details of the well construction procedures are provided below.

Repository well borings were constructed by first drilling and installing large diameter, steel surface casing to prevent caving of unconsolidated overburden. Next, the borehole was advanced to the mine and long-string steel casing was then welded and lowered into the borehole. A Type A neat cement grout was pumped down through the casing and up the annular area between the casing and the boring. A wiper was installed inside the casing and pumped to the bottom of the casing using a bentonite slurry behind the wiper. The wiper pushes the grout up and out of the inner annulus as it travels to the bottom of the hole. The bentonite slurry prevents the grout from migrating behind the wiper and plugging the casing. The truck tickets which record the amount of cement grout used are included in Appendix L.

The long string steel casing extends a few feet below the mine roof and is open to the surface. The casing can be observed from within the mine showing a complete grout seal surrounding the casing. Any signs of water seepage, if any, along the casing/grout/limestone interface will be recorded.

The wells were completed by installing the injection tubing. The injection tubing is supported at the well-head by welding flanges to the long string casing. The well casing details are specified in Attachment M below and depicted on Figure M-1.

The injection wells are completed with injection tubing with no packer or sealing fluid in the annulus between the injection tubing and the long string casing. This well construction allows for daily visual observation for leaks in the underground mine workings. If leaks are detected, the

injection processes will be temporarily halted and the injection tubing will be removed and repaired as described in Attachment O. Otherwise, the injection tubing is periodically replaced during scheduled plant maintenance shut downs.

### ATTACHMENT M - UIC WELL CONSTRUCTION DETAILS

Figures M-1A and M-1B depict construction details for the existing UIC wells. Two existing UIC wells, KYV0002 and KYV0003, were constructed in April 1992. Construction procedures are summarized in the previous Attachment L. A list of detailed well construction materials is provided below.

### Black River Well #1(EPA ID # KYV0002)

### **Surface Casing:**

Wall Thickness: 0.375 inch
Diameter: 20 inch

Specification: Schedule 40 Steel Pipe Nominal Weight: 78.6 pounds per foot

Installation Length: Unknown

Joint Specification: Welded as lowered

### **Borehole Casing:**

Wall Thickness: 0.375 inch
Diameter: 12-3/4 inch

Specification: A53 Schedule 40 steel pipe Nominal Weight: 53.52 pounds per foot

Installation Length: 626 feet

Joint Specification: Welded as lowered

### **Injection Tube (Borehole Slurry Pipe):**

Wall Thickness: Unknown Diameter: 5 inch

Specification: A53 Schedule 40 steel pipe

Nominal Weight: Unknown Installation Length: 645 feet

Joint Specification: Welded as lowered

### **Borehole Diameters:**

Diameter Through Overburden: 24 inch Diameter Into Mine: 15-1/4

### Black River Well #2 (EPA ID # KYV0003)

### **Surface Casing:**

Wall Thickness: 0.375 inch
Diameter: 20 inch

Specification: Schedule 40 Steel Pipe Nominal Weight: 78.6 pounds per foot

Installation Length: 61 feet

Joint Specification: Welded as lowered

### **Borehole Casing:**

Wall Thickness: 0.375 inch
Diameter: 12-3/4 inch

Specification: A53 Schedule 40 steel pipe Nominal Weight: 53.52 pounds per foot

Installation Length: 632 feet

Joint Specification: Welded as lowered

### **Injection Tube (Borehole Slurry Pipe – 3 Injection Tubes):**

Wall Thickness: 0.280 inch
Diameter: 4 inch

Specification: A53 Schedule 40 steel pipe Nominal Weight: 18.97 pounds per foot

Installation Length: 652 feet

Joint Specification: Welded as lowered

### **Borehole Diameters:**

Diameter Through Overburden: 24 inch Diameter Into Mine: 15 ¼ inch

### **ATTACHMENT N - CHANGES IN INJECTION FLUID (Class III well only)**

This attachment is not applicable for this Class V Permit Application.

### ATTACHMENT O - PLANS FOR WELL FAILURES

Any failure of the injection tube (borehole slurry pipe) resulting in an uncontrolled discharge into the mine will require immediate attention as the mine cannot operate under those conditions. Mine personnel will shut down the repository system and repair or replace the defective borehole slurry pipe. The pipe can be hoisted to the surface in order for the repairs to be made. Upon completion of repairs, a test will be run on the operating system with clean water to visually

inspect the system. The open air annulus will be visually inspected for leakage in the mine during the clean water test. Upon completion of the test, normal operations will resume.

Any detection of fluids being discharged from the wellhead onto the ground surface will require that operation of the repository system be shutdown and scheduled for repairs. Upon completion of the wellhead repairs, a test will be run on the operating system with clean water to visually inspect the system. Upon completion of the test, normal operations will resume.

### ATTACHMENT P - MONITORING PROGRAM

USDW monitoring wells are not proposed for this permit application. There is negligible risk that the USDW could be impacted by the injection wells and mine backfilling operation. One of the key components of risk assessment is the evaluation of the exposure pathway between the risk under consideration and the potential receptor of that risk. The UIC well design, the closed-loop injection system design, and the natural confining characteristics of the mining horizon and overlying geologic strata collectively eliminate any exposure pathway between the USDW and the injectate. The following features demonstrate why there is negligible risk associate with this process:

- Injection occurs via gravity flow, thus there is no hydraulic pressure in the deep mine repository and no fracture pressure on the surrounding geologic formations.
- An open-air annulus between the long string casing and the injection tubing creates an inward and downward hydraulic gradient from the USDW toward the UIC well which eliminates the risk that injectate could enter the USDW.
- The open-air annulus will direct potential leakage from the injection tubing downward into the deep mine repository (Figure M-1 of the permit application).
- Potential leakage from the injection tubing or long string casing is visually monitored weekly at the well penetration into the mine. Detected leakage will be repaired as soon as possible.
- The injectate is placed only within designated areas of the mine and contained by a series of dams.
- Solids that settle out of the injectate slurry consist of a granular solid which is not mobile.
- The slurry injection/deposition process is a closed loop system where decant from the injectate is pumped back to the ground surface and re-circulated into the slurry mixing system.
- The mine workings are surrounded by impermeable confining strata, including the Camp Nelson Limestone that comprises the mining horizon, and the overlying Oregon and Tyrone Formations.

- The backfilling operation is closely monitored and pump auto-shut offs incorporated so that any blockage of the injection tubing will be detected and the pumps shut-down until the blockage is located and cleared.
- The constructed retention berms are a maximum of 22 feet high at any one point. Considering the mine roof is in excess of 55 feet, there is no potential for injectate to reach the mine roof, annulus or other openings and reach the USDW.
- The approximate vertical distance between the mine roof and USDW is 545 feet (Figure F-2), further demonstrating the highly unlikely potential of injectate migration into the USDW.

Considering all of the individual points above in aggregate, the well design, mining practices and physical proximity of the elements eliminate a potential exposure pathway between the injectate and the USDW. A detailed discussion of each of the points above follows.

### Well Design

The UIC well design depicted on Figure M-1 of the permit application includes an open-air annulus that extends from the ground surface to the deep mine, between the outer steel casing (long string casing) and the injection tubing. Any leakage from the injection tubing will flow down the open-air annulus into the mine workings via gravity flow. No mechanism exists to force leakage through the long string casing and into the USDW.

### **USDW Inward Hydraulic Gradient**

Figure M-1 depicts the difference in potentiometric head in the USDW adjacent to the proposed UIC well compared to the mine roof elevations (injectate repository). The lowest elevation of the USDW is located at the saline-fresh water interface at approximate elevation 400 feet *above* mean sea level. The Carmeuse deep mine is constructed from elevation 145 to 195 feet *below* mean sea level. As described previously, the proposed UIC well design includes an open-air annulus that extends from the ground surface to the deep mine workings. There is no head in the annulus along its entire length from the ground surface to the mine floor. Thus, there is an inward and downward hydraulic gradient of approximately -545 feet/foot to -595 feet/foot from the bottom of the USDW, adjacent to the injection well, to the well penetration into the deep mine opening. This inward gradient eliminates the risk that injectate could enter the USDW.

### **Containment of the Injectate**

The proposed injection process is a closed loop system where the injectate is a solid material, the repository formation is essentially impermeable, and the slurry decant will be collected and

<sup>&</sup>lt;sup>1</sup> Hopkins, H.T., 1966. The Fresh-Saline Water Interface in Kentucky, U.S. Geological Survey and Kentucky Geological Survey.

re-circulated to the slurry mixture. Based on the absence of ground water in the mine workings, these strata are essentially impermeable and non-water bearing. It is in the best interests of mine operations and safety to prevent even minor flooding from occurring in the mine. Berms are constructed to contain the injectate and prevent the migration of the slurry decant to other portions of the mine while also allowing deposition of the solid limestone fines or kiln dust in designated repositories in the mine. Continued monitoring, inspection and maintenance of these structures will also be enforced by the US Mine Safety and Health Administration throughout the life of the mine. These practices will also prevent the limestone fines or kiln dust from rising to the level of the mine roof, and thence through any openings that may communicate with the USDW that is positioned approximately 545-feet above the mine roof.

### **Injection Operations**

The injection process is closely monitored by mine personnel, and a pressure switch / automatic pump shut-off is installed at the well-head to immediately detect blockages and thus prevent excess pressure head in the injection tubing, i.e. pressure in excess of that required to deliver the slurry to the well-head.

### **Well Design and Mine Operations Summary**

In summary, the well design, injection and mine operations, and the USDW inward hydraulic gradient preclude the possibility that an exposure pathway exists between the limestone fines or kiln dust and the USDW due to any leakage of injectate from the UIC wells or the deep mine repository. Minimal positive pressure within the injection tubing, an open-air annulus that directs potential injection tube leakage downward to the mine repository, an inward and downward hydraulic gradient from the USDW that prevents injectate from entering the USDW, an outer steel casing grouted in place and sealing the UIC well from the USDW, automatic pump shut-offs that prevent significant pressure head from developing in the injection tubing, and mine operations that preclude the possibility that the slurry will flood the mine, are features that combine to form an incomplete exposure pathway between limestone fines/kiln dust and potential human receptors. Therefore, no adverse human health risk exists which would require USDW groundwater monitoring wells.

### ATTACHMENT Q - PLUGGING AND ABANDONMENT PLAN

Plugging and abandonment of the permitted repository wells shall be in accordance with 40 CFR 146.10 and the Kentucky Geologic Survey, Oil and Natural Gas division. The plugging of one or more repository wells shall be performed in the manner described below:

- 1. The injection tube will be removed from the long string casing.
- 2. A mechanical plug will be placed at the base of the long string casing.

- 3. A continuous cement plug of Class A neat cement will be placed within the long string casing from the top of the mechanical plug to three feet below the ground surface.
- 4. All casing strings will be cut off below grade.
- 5. The area will be graded and restored.

### ATTACHMENT R - NECESSARY RESOURCES

Carmeuse will provide financial assurance for plugging and abandonment of the existing and proposed Class V UIC wells. The method of financial assurance will be one of the following:

- Trust fund;
- Surety bond;
- Letter of credit:
- Insurance; or
- Financial test.

A completed financial assurance document from Carmeuse will be appended to Appendix R-1 following issuance of the Class V permit renewal by USEPA.

### ATTACHMENTS - AQUIFER EXEMPTIONS

Carmeuse does not wish to seek an aquifer exemption.

### ATTACHMENT T - EXISTING EPA PERMITS

A list of existing permits for the Carmeuse Black River deep mine are provided in Table T-1.

### ATTACHMENT U - DESCRIPTION OF BUSINESS

Carmeuse Lime and Stone provides lime, limestone, and, sand products and related technology for a variety of commercial and industrial applications. Their primary customers represent the following industries:

- Steel Industry
- Flue Gas Desulfurization
- Road Construction (Soil Stabilization and Asphalt)
- Water Treatment
- Environmental Treatment
- Paper Industry

- Chemical Industry
- Industrial Sands

Carmeuse products include a full range of high calcium and dolomitic quicklime, hydrated lime, and milk of lime, plus chemical limestone and sand products.

5.0 REFERENCES

### 5.0 REFERENCES

The following is a list of information sources that were used to complete the Attachments.

- 1. Code of Federal Regulation, Tile 40, United States Government Printing Office, Washington, D.C., 1989
- 2. Hopkins, Herbert T., "Fresh-Saline Water Interface Map of Kentucky," Kentucky Geological Survey, Lexington, Kentucky, 1966.
- 3. W.M. Palmquist, Jr., and F.R. Hall. "Availability of Groundwater in Boone, Campbell, Grant, Kenton, and Pendleton Counties, Kentucky." United States Geological Survey, 1960.

FIGURES

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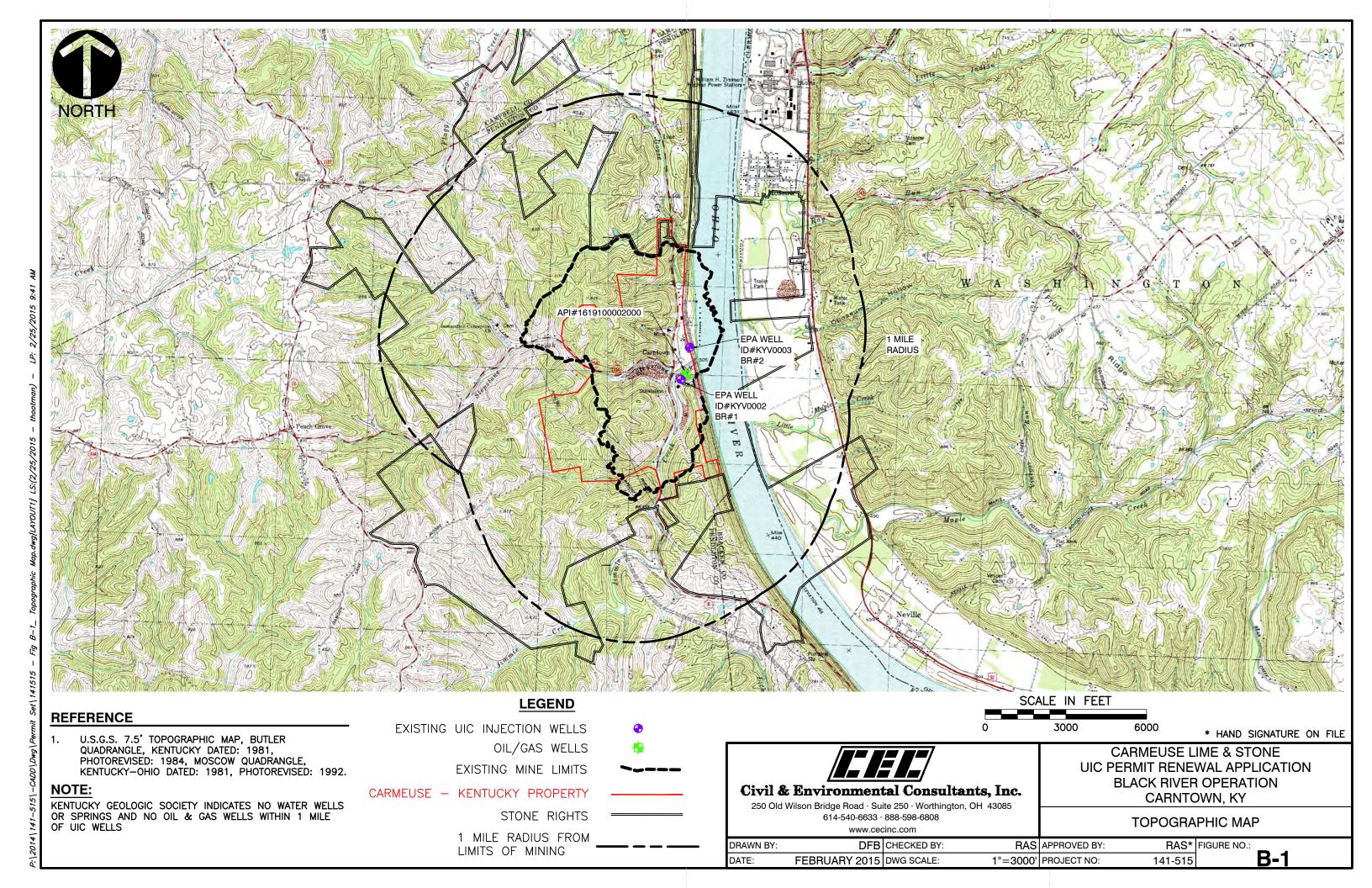
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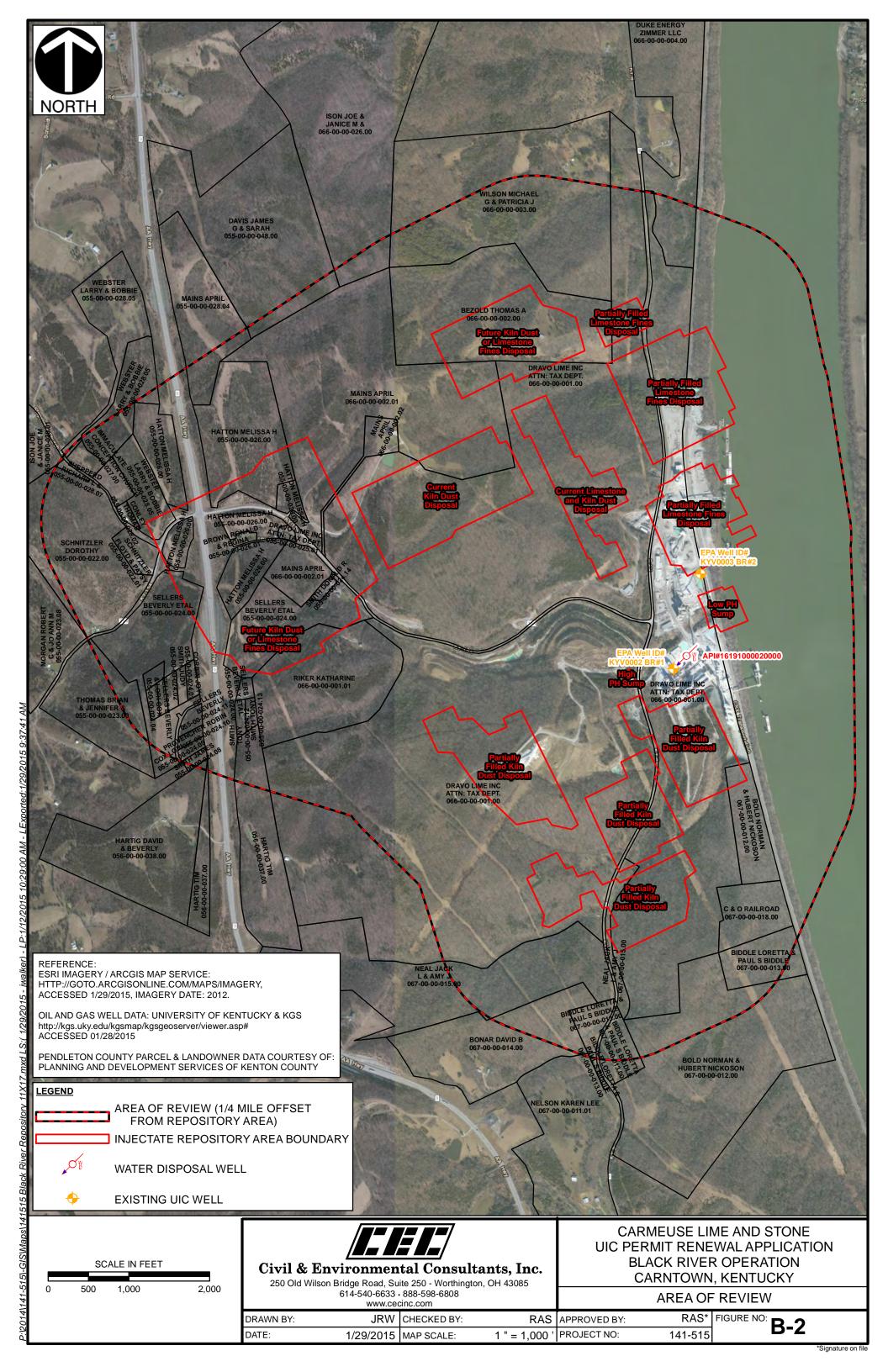
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**UIC PERMIT RENEWAL APPLICATION BLACK RIVER OPERATION** CARNTOWN, KY

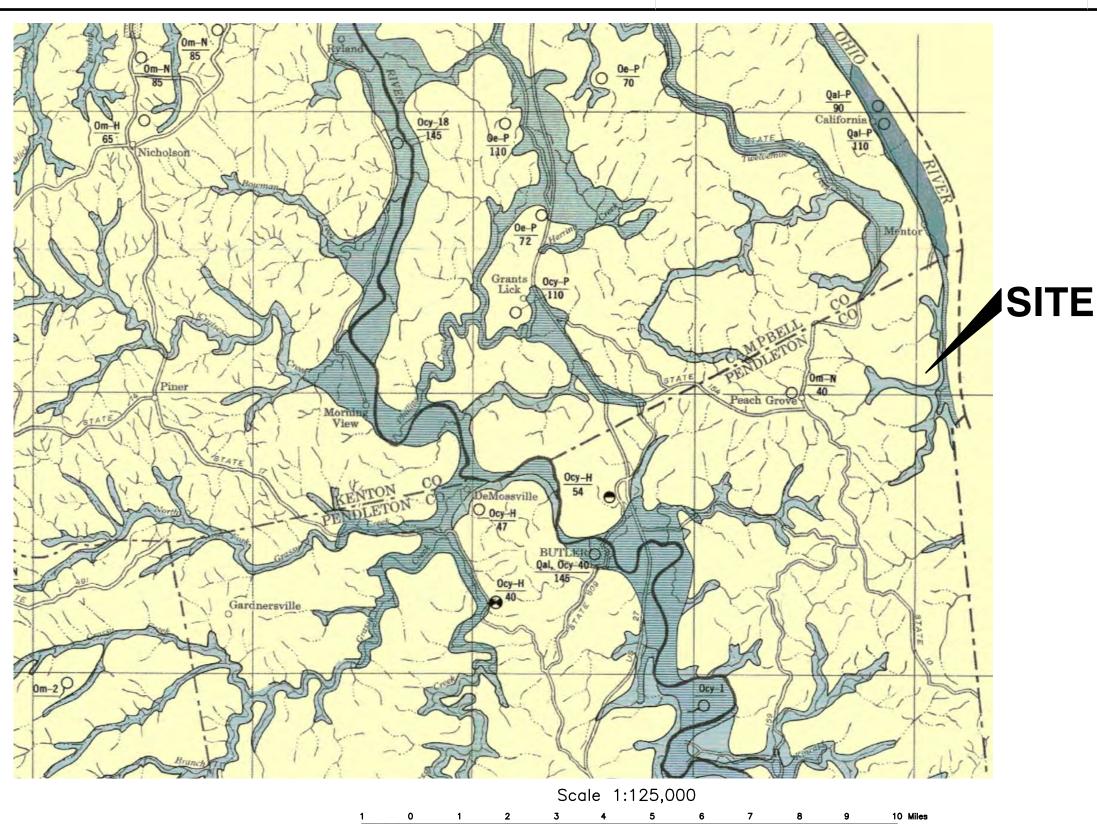
SITE LOCATION MAP

DRAWN BY: BTW CHECKED BY: DFB APPROVED BY: RAS\* FIGURE NO.: 141-515 OCT. 2014 DWG SCALE: 1"=4000' PROJECT NO: DATE:









**EXPLANATION** 



AREA 1

MANY PROPERLY CONSTRUCTED DRILLED WELLS IN THIS AREA WILL PRODUCE SEVERAL HUNDRED GALLONS PER MINUTE FROM ALLUVIAL MATERIAL UNLESS BEDROCK IS ENCOUNTERED AT SHALLOW DEPTHS. MAXIMUM REPORTED YIELD IS 600 GPM. MOST DRILLED WELLS WILL PRODUCE ENOUGH WATER FOR A DOMESTIC SUPPLY WITH A POWER PUMP AND PRESSURE SYSTEM (MORE THAN 500 GALLONS A DAY) AT DEPTHS OF LESS THAN 100 FEET. WATER IS HARD OR VARY HARD BUT OTHERWISE OF GOOD QUALITY.



AREA 2

MOST DRILLED WELLS IN THIS AREA WILL PRODUCE ENOUGH WATER FOR A DOMESTIC SUPPLY WITH A POWER PUMP AND A PRESSURE SYSTEM (MORE THAN 500 GALLONS A DAY) AT DEPTHS OF LESS THAN 100 FEET. SOME WELLS PRODUCE AS MUCH AS 150 GALLONS PER MINUTE FROM ALLUVIUM OR THICK LIMESTONE ALONG LARGE STREAMS. WATER IS HARD OR VERY HARD AND MAY CONTAIN SALT OR HYDROGEN SULFIDE, ESPECIALLY AT DEPTHS GREATER THAN 100 FEET.



AREA 3

MOST DRILLED WELLS IN THIS AREA WILL PRODUCE ENOUGH WATER FOR A DOMESTIC SUPPLY WITH A HAND PUMP (100 TO 500 GALLONS A DAY) AT DEPTHS OF LESS THAN 100 FEET. SOME WELLS WILL PRODUCE MORE THAN 500 GALLONS A DAY EXCEPT DURING DRY WEATHER. WATER IS HARD OR VERY HARD AND MAY CONTAIN SALT OR HYDROGEN SULFIDE ESPECIALLY AT DEPTHS GREATER THAN 100 FEET.



AREA 4

MOST DRILLED WELLS IN THIS AREA WILL NOT PRODUCE ENOUGH WATER FOR A DEPENDABLE DOMESTIC SUPPLY (100 GALLONS A DAY). WELLS ALONG DRAINAGE LINES MAY PRODUCE ENOUGH WATER FOR A DOMESTIC SUPPLY EXCEPT DURING DRY WEATHER. WATER IS HARD AND MAY CONTAIN SALT OR HYDROGEN SULFIDE AT DEPTHS GREATER THAN 100 FEET.

\* HAND SIGNATURE ON FILE

**CARMEUSE LIME & STONE UIC PERMIT RENEWAL APPLICATION BLACK RIVER OPERATION** CARNTOWN, KY

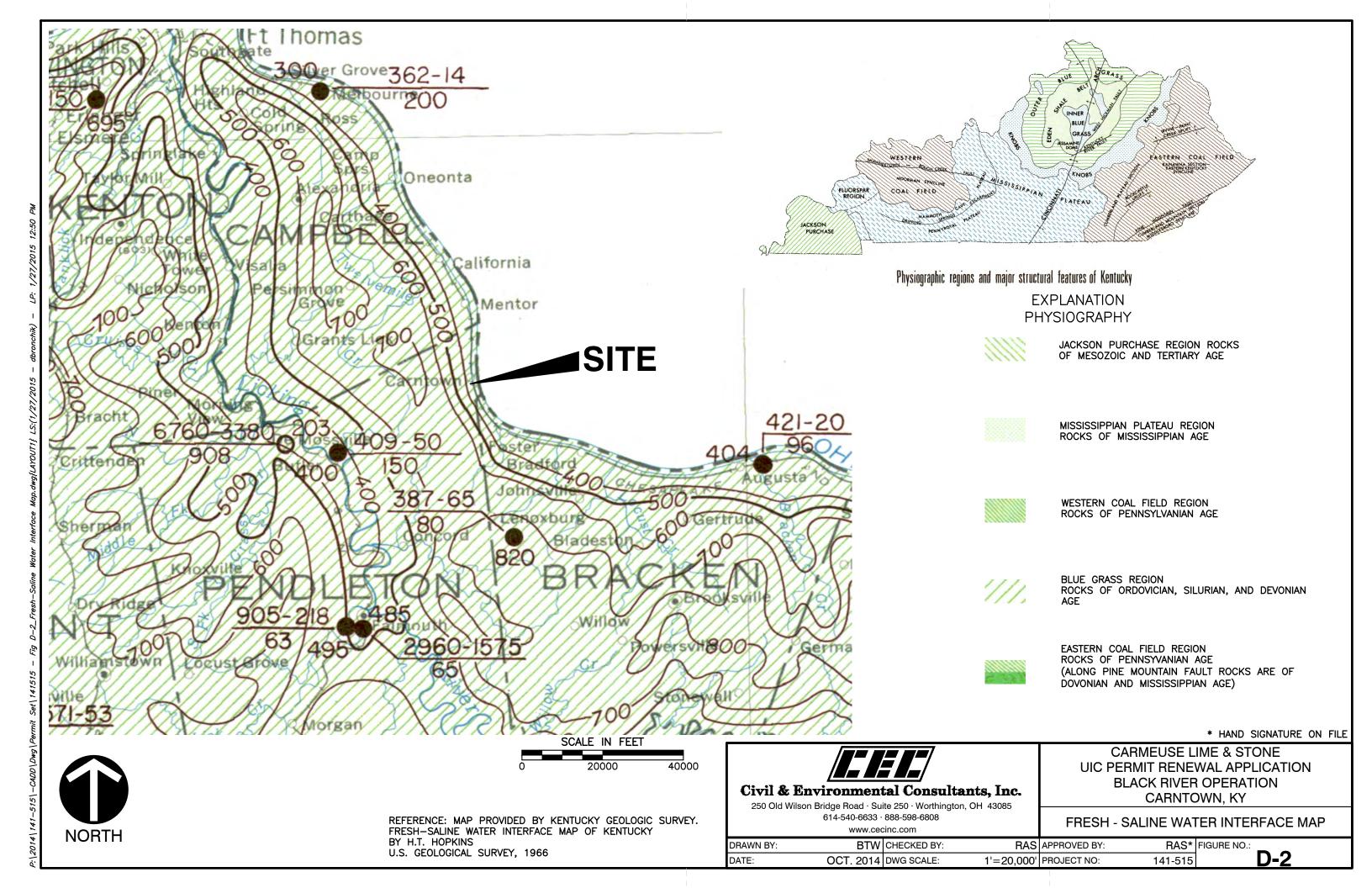
**AVAILABILITY OF GROUNDWATER** 

JFK APPROVED BY: RAS\* FIGURE NO.: DRAWN BY: BTW CHECKED BY: OCT. 2014 DWG SCALE: 1:125.000 PROJECT NO: DATE: 141-515

REFERENCE: MAP PROVIDED BY KENTUCKY GEOLOGIC SURVEY AVAILABILITY OF GROUND WATER IN BOONE, CAMPBELL, GRANT, KENTON, AND PENDLETON COUNTIES, KENTUCKY. W.N. PALMQUEST, JR., AND F.R. HALL U.S. GEOLOGICAL SURFACE, 1960.

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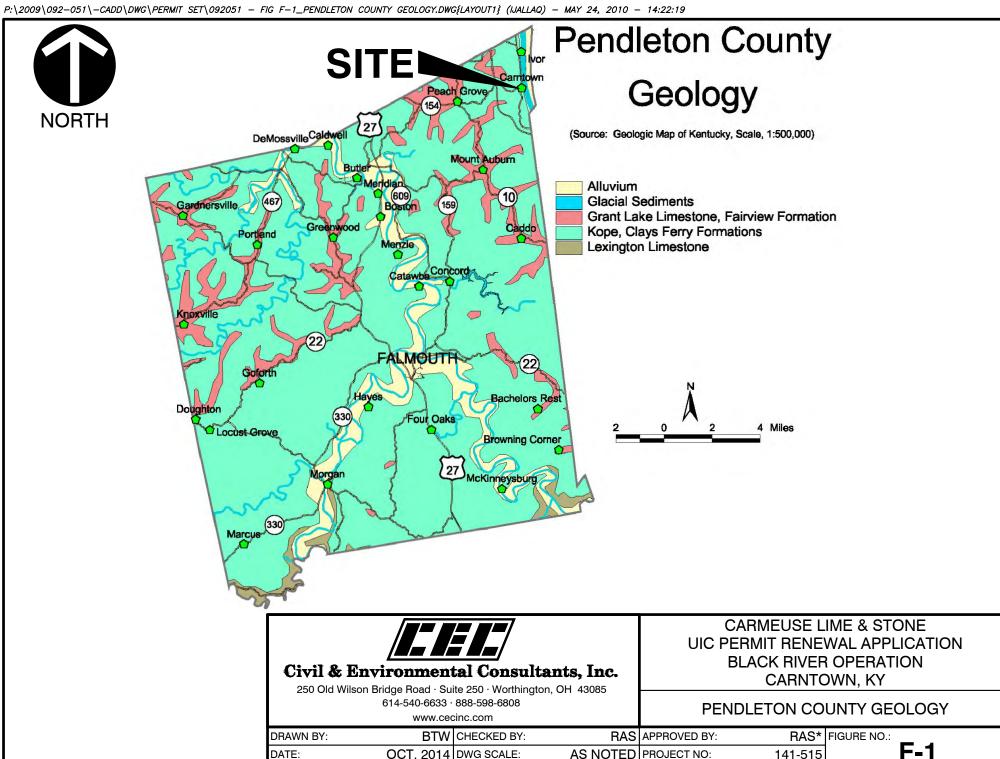
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### <u>Generalized Stratigraphic Column</u> <u>Carntown Area</u>

Α	AGE GROUP FORMATION AND THICKNESS		FORMATION AND THICKNESS	IMPORTANT MARKERS & MINING HORIZONS
	UPPER		KPOE FORMATION 250±	HIGEST EXPOSED FORMATION ON CARMEUSE PROPERTY
	\ \ \		POINT PLEASANT 110±	
			LEXINGTON LIMESTONE 195±	
ORDOVICIAN	MIDDLE	E GROUP BLACK RIVER P)	TYRONE FORMATION 121'  OREGON FORMATION 14'  CAMP NELSON FORMATION 300'-350'	→ UPPER BENTONITE
ORE		HIGH BRIDGE GROUP (ALSO CALLED BLACK RIVER GROUP)	MINED ZONE	CABIN CREEK MINING HORIZON CARNTOWN MINING
			WELLS CREEK 40±	HORIZON  UNCONFORMITY
CAMBRIAN	UPPER	KNOX GROUP	DOLOMITES (UPPER PART)	

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CARMEUSE LIME & STONE
UIC PERMIT RENEWAL APPLICATION
BLACK RIVER OPERATION
BUTLER, KY

GENERALIZED STRATIGRAPHIC COLUMN

	DRAWN BY:	BTW	CHECKED BY:	JFK	APPROVED BY:	RAS*	FIGURE NO.:
•	DATE:	OCT 2014	DWG SCALE:	NTS	PROJECT NO:	141-515	F-2

\* HAND SIGNATURE ON FILE

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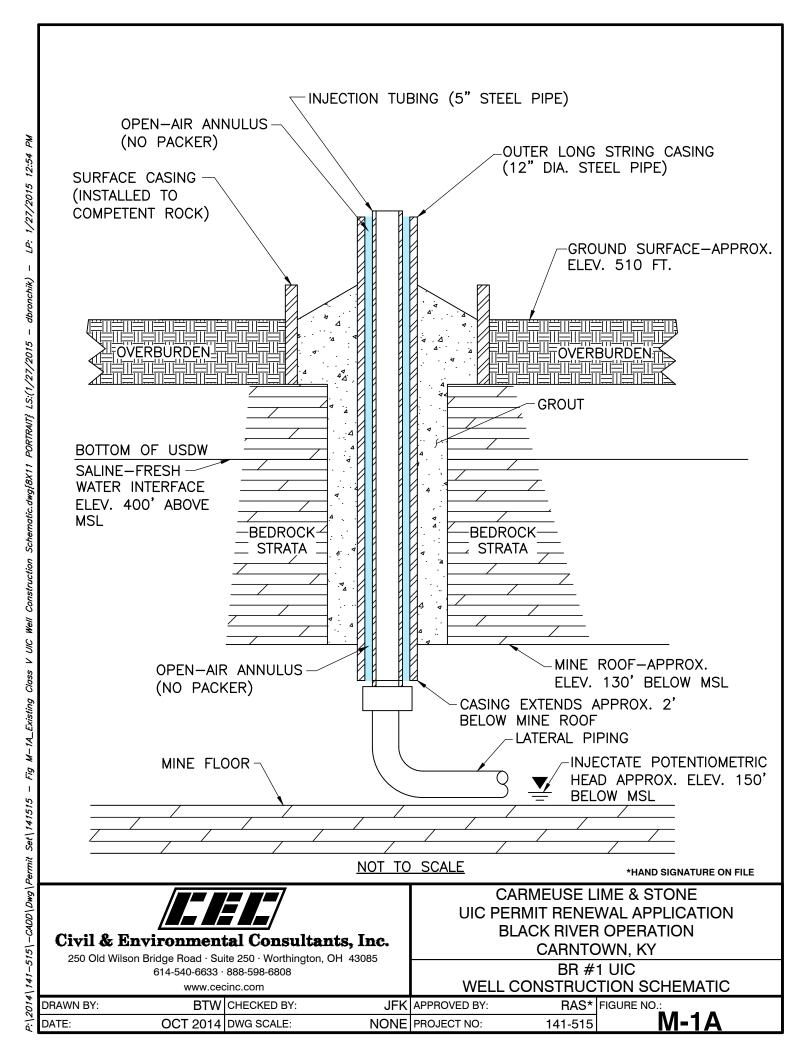
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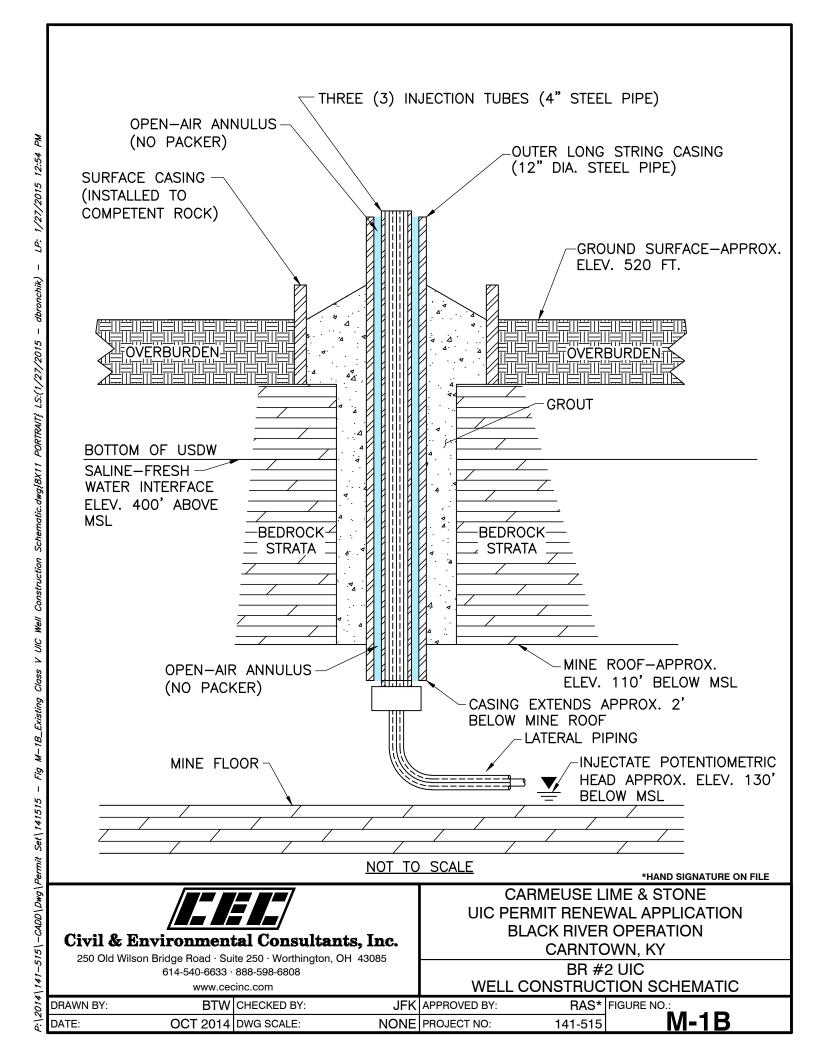
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**UIC PERMIT RENEWAL APPLICATION BLACK RIVER OPERATION** CARNTOWN, KY

PROCESS DIAGRAM







TABLES	

TABLE B-1
PROPERTY OWNERS WITHIN THE 1/4 MILE AREA OF REVIEW
CARMEUSE LIME & STONE
UIC PERMIT RENEWAL APPLICATION
CEC Project 141-515

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December 19					KARL & JESSICA ENZWEILER				
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065-09-00-0243   117 ACRES (1071 19. AGH) & REIDS   199-033   SMITH TONY   14469 ALHWY   54 BUTLER   KY   41006   1055-09-00-0265   1 763 ACRES & HOUSE   230-140   DANOLIME INC. ATTR. TAX DEPT.   CIG CARMEUSE NORTH AMERICA   115 TANOVIN, ST 1171 FLOOR   PTITSBURGH   PA   1522-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00-00-00   PA   1457 ACRES   230-145   PATITOR NELISSAH   115 STEPHENS DR   FALMOUTH   KY   1400-00-00-00-00-00-00-00-00-00-00-00-00-	055-00-00-024.11		199-023	SELLERS BEVERLY		41 SOUTHGATE AVE	FT THOMAS	KY	41075
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055-00-00270   05-00-00270   05-00-00280									
055-00-00-028-01   4-0.071 ACRES & 14 HOUSES   270-628   SON JOE & JANICE M   441 STEPSTONE CHURCH RD   BUTLER   KY   41006-005-00-00-028-02   1-34 ACRES & MH & BLDO   292-678   CONLEY THOMAS   132 STEPSTONE CHURCH RD   BUTLER   KY   41006-005-00-00-028-05   66-7128 ACRES   319-900   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-005-00-00-028-05   66-7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091-005-00-00-028-05   66-7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091-005-00-00-028-05   66-7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091-005-00-00-028-05   66-7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091-005-00-00-028-05   ASSIS ACRES   200-20-20-00-00-028-05   ASSIS ACRES   200-20-00-00-028-05   ASSIS ACRES   200-20-00-00-00-00-00-00-00-00-00-00-00-									
055-00-00-028-02									
055-00-00-028-04   27.8752 ACRES   319-600   MAINS APPIL   PO BOX 117   CALIFORNIA KY   41007-055-00-00-028-05   68.7128 ACRES   270-676   WEBSTER LARRY & BOOBBIE   2000 HOLDERNESS DRIVE   UNION KY   41091   055-00-00-028-05   68.7128 ACRES   270-676   WEBSTER LARRY & BOOBBIE   2000 HOLDERNESS DRIVE   UNION KY   41091   055-00-00-028-05   68.7128 ACRES   270-676   WEBSTER LARRY & BOOBBIE   2000 HOLDERNESS DRIVE   UNION KY   41091   055-00-00-028-07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE KY   41035-055-00-00-028-07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE KY   41035-055-00-00-028-07   3.458 ACRES   4104-05   DRAW JAMES G & SARAH   230 SCHMIDT LIN   CALIFORNIA KY   41097-055-00-00-028-07   3.458 ACRES   4104-05   DRAW JAMES G & SARAH   230 SCHMIDT LIN   CALIFORNIA KY   41097-055-00-00-00-037-00   3.458 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE KY   41059-056-00-00-039-00   49.24 ACRES   225-230   HARTIG DAVID & SEVERLY   CIO WELLS FARGO BANK NA   376 STATEVIR BLOG   PT MILL   SC   2971-10   DRAW JUME NO ATTIVITY AND				l l					
055-00-00-028.05   66.7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091   055-00-00-028.05   66.7128 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41091   055-00-00-028.07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-028.07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-048.00   173-31 ACRES & BUJUSIE & MTL BLOD   314-406   DAVIS JAMES G & SARAH   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-037.00   34.56 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41095-055-00-00-037.00   34.56 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41059-055-00-00-00-00-00-00-00-00-00-00-00-00									
055-00-00-028.05   66.7126 ACRES   270-676   WEBSTER LARRY & BOBBIE   2000 HOLDERNESS DRIVE   UNION   KY   41991   055-00-00-028.07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-028.07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-028.07   3.4839 ACRES   260-520   SHEPPERD RICHARD L & JANELL R BAKER   235 JESSICA ST LOT 52   DRY RIDGE   KY   41035-055-00-00-008.00   173.31 ACRES & HOUSE & MT. BLDG   314-406   DAVIS JAMES G & SARAH   230 SCHMIDT LN   CALIFORNIA   KY   41007-055-00-00-009.00   34.56 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41059-055-00-00-093.00   34.56 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41059-056-00-00-093.00   49.24 ACRES   225-230   HARTIG TOWN   ACRES   ACRES   4010   ACRES				l l					
055-00-00-028.07   3.4839 ACRES   270-676   WEBSTER LARRY & BOBBIE   200 HOLDERNESS DRIVE   UNION   KY   41091	1								
055-00-00-028 07         3.4839 ACRES         260-520         SHEPPERD RICHARD L & JANELL R BAKER         235 JESSICA ST LOT 52         DRY RIDGE         KY         41035-05-00-00-00-00-00-00-00-00-00-00-00-00									
055-09-09-048.00   173.31 ACRES & HOUSE & MT. BLDG   314-406   DAVIS JAMES   6. SARAH   230 SCHMIDT IX   CALIFORNIA   KY   41037-055-09-09-048.00   173.31 ACRES & HOUSE & MT. BLDG   314-406   DAVIS JAMES   6. SARAH   230 SCHMIDT IX   CALIFORNIA   KY   41037-055-09-09-037.00   34.58 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41059-055-09-09-037.00   34.58 ACRES   156-331   HARTIG TIM   3029 FENDER   MELBOURNE   KY   41059-055-09-09-038.00   49.24 ACRES   225-230   HARTIG DAVID & BEVERLY   CO WELLS FARCO BANK NA   3476 STATEVIEW BLVD   FF MILL   SC   29715-065-09-09-001.00   881 629 ACRES & BUILDINGS   294-071   DRAVO LIME INC ATTN: TAX DEPT.   C/O CARMEUSE NORTH AMERICA   11 STAWNIX ST 11TH FLOOR   PITTSBURGH   PA   15222-065-09-09-001.01   47.78 ACRES & BUILDINGS   294-071   DRAVO LIME INC ATTN: TAX DEPT.   C/O CARMEUSE NORTH AMERICA   11 STAWNIX ST 11TH FLOOR   PITTSBURGH   PA   15222-065-09-09-001.01   47.78 ACRES & BUILDINGS   294-071   DRAVO LIME INC ATTN: TAX DEPT.   C/O CARMEUSE NORTH AMERICA   11 STAWNIX ST 11TH FLOOR   PITTSBURGH   PA   15222-065-09-09-001.01   47.78 ACRES & HOUSE   314-016   RIKER KATHARINE   11 STAWNIX ST 11TH FLOOR   PITTSBURGH   PA   15222-065-09-09-001.01   47.78 ACRES & HOUSE   314-016   BEZOLD THOMAS   12 ACRES & METAL BLDGS   179-246   BEZOLD THOMAS   12 ACRES & METAL BLDGS   179-246   BEZOLD THOMAS   12 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-09-09-002.01   121.02 ACRES & METAL BLDG					JANELL R BAKER				
055-00-00-048,00				l l					
056-00-00-037.00   34.56 ACRES   156-331   HARTIG TIM	1								
056-00-00-038.00		34.56 ACRES		HARTIG TIM					41059-
066-00-00-001-00	056-00-00-037.00	34.56 ACRES	156-331	HARTIG TIM		3029 FENDER	MELBOURNE	KY	41059-
DRAVO LIME INC. ATTN: TAX DEPT.   C/O CARMEUSE NORTH AMERICA   11 STANWIX ST 11TH FLOOR   PITTSBURGH   PA   15222-	056-00-00-038.00	49.24 ACRES	225-230	HARTIG DAVID & BEVERLY	C/O WELLS FARGO BANK NA	3476 STATEVIEW BLVD	FT MILL	SC	29715-
DRAYO LIME INC. ATTN: TAX DEPT.   C/O CARMEUSE NORTH AMERICA   11 STANWIX ST 11TH FLOOR   PITTSBURGH   PA   15222-	066-00-00-001.00	881.629 ACRES & BUILDINGS	294-071	DRAVO LIME INC ATTN: TAX DEPT.	C/O CARMEUSE NORTH AMERICA	11 STANWIX ST 11TH FLOOR	PITTSBURGH	PA	_
066-00-00-001.01									
066-00-000.200			294-071		C/O CARMEUSE NORTH AMERICA				
066-00-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-00-002.01   121.02 ACRES & METAL BLDG   244-380   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-00-00-002.02   5.48 ACRES & HOUSE   262-259   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-066-00-003.00   99.472 ACRES & HOUSE   196-127   WILSON MICHAEL G & PATRICIA J   PO BOX 117   CALIFORNIA   KY   41007-066-00-00-004.00   288.4491 ACRES & HOUSE   325-501   DUKE ENERGY ZIMMER LLC   550 SOUTH TRYON ST   MAIL CODE DEC41B   CHARLOTTE   NC   2802-00-004.00   288.4491 ACRES & HOUSE   325-501   DUKE ENERGY ZIMMER LLC   550 SOUTH TRYON ST   MAIL CODE DEC41B   CHARLOTTE   NC   2802-00-00-004.00   A18.12 ACRES & HOUSE   325-501   DUKE ENERGY ZIMMER LLC   550 SOUTH TRYON ST   MAIL CODE DEC41B   CHARLOTTE   NC   2802-00-00-004.00   A18.12 ACRES & HOUSE   221-300   NELSON KAREN LEE   HUBERT LEE NICKOSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-011.01   85.93 ACRES & HOUSE   221-300   NELSON KAREN LEE   HUBERT LEE NICKOSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-012.00   105 ACRES   250-352   BOLD NORMAN & HUBERT NICKOSON   KAREN NELSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN									
066-00-00-02.01   121.02 ACRES & METAL BLDG				l l					
066-00-002.02   5.48 ACRES & HOUSE   262-259   MAINS APRIL   PO BOX 117   CALIFORNIA   KY   41007-006-00-003.00   99.472 ACRES & HOUSE   196-127   WILSON MICHAEL G & PATRICIA J   PO BOX 672   ALEXANDRIA   KY   41001-006-00-004.00   288.4491 ACRES & HOUSE   325-501   DUKE ENERGY ZIMMER LLC   550 SOUTH TRYON ST   MAIL CODE DEC41B   CHARLOTTE   NC   28202-0066-00-026.00   148.12 ACRES & 2 HOUSES & GARAGE   303-040   ISON JOE & JANICE M & BRENDA N & JACK A WAGNER   60 ISON LN   CALIFORNIA   KY   41007-007-00-011.01   85.93 ACRES & HOUSE   221-300   NELSON KAREN LEE   HUBERT LEE NICKOSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-012.00   105 ACRES   250-352   BOLD NORMAN & HUBERT NICKOSON   KAREN NELSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-13.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PA									
066-00-00-033.00         99.472 ACRES & HOUSE         196-127         WILSON MICHAEL G & PATRICIA J         FO BOX 672         ALEXANDRIA         KY         41001           066-00-00-004.00         288.4491 ACRES & HOUSE         325-501         DUKE ENERGY ZIMMER LLC         550 SOUTH TRYON ST         MAIL CODE DEC41B         CHARLOTTE         NC         28202-           066-00-00-026.00         148.12 ACRES & 2 HOUSES & GARAGE         303-040         ISON JOE & JANICE M &         BRENDA N & JACK A WAGNER         60 ISON LN         CALIFORNIA         KY         41007-           067-00-00-011.01         85.93 ACRES & HOUSE         221-300         NELSON KAREN LEE         HUBERT LEE NICKOSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-013.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HO									
066-00-00-004.00         288.4491 ACRES & HOUSE         325-501         DUKE ENERGY ZIMMER LLC         550 SOUTH TRYON ST         MAIL CODE DEC41B         CHARLOTTE         NC         28202-           066-00-00-026.00         148.12 ACRES & 2 HOUSES & GARAGE         303-040         ISON JOE & JANICE M & BRENDA N & JACK A WAGNER         60 ISON LN         CALIFORNIA         KY         41007-           067-00-00-011.01         85.93 ACRES & HOUSE         221-300         NELSON KAREN LEE         HUBERT LEE NICKOSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE				_					
066-00-00-026.00         148.12 ACRES & 2 HOUSES & GARAGE         303-040         ISON JOE & JANICE M & BRENDA N & JACK A WAGNER         60 ISON LN         CALIFORNIA         KY         41007-067-00-00-011.01           067-00-00-011.01         85.93 ACRES & HOUSE         221-300         NELSON KAREN LEE         HUBERT LEE NICKOSON         13843 HWY 8         FOSTER         KY         41043-067-00-00-012.00           067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043-067-00-00-013.00         KAREN NELSON         13843 HWY 8         FOSTER         KY         41001-00-00-013.00         KAREN NELSON         13843 HWY 8         FOSTER         KY         41001-00-00-013.00         KY         41001-00-00-00-00-00-00-00-00-00-00-00-00					550 00:				
067-00-00-011.01   85.93 ACRES & HOUSE   221-300   NELSON KAREN LEE   HUBERT LEE NICKOSON   13843 HWY 8   FOSTER   KY   41043-067-00-00-012.00   105 ACRES   250-352   BOLD NORMAN & HUBERT NICKOSON   KAREN NELSON   13843 HWY 8   FOSTER   KY   41043   667-00-00-012.00   105 ACRES   250-352   BOLD NORMAN & HUBERT NICKOSON   KAREN NELSON   13843 HWY 8   FOSTER   KY   41043   667-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   24 ACRES & HOUSE   286-322   BIDDLE LORETTA & PAUL S BIDDLE   724 LAKEVIEW LN   ALEXANDRIA   KY   41001-067-00-00-013.00   36.344 ACRES & HOUSE   289-298   BONAR DAVID B   14265 HWY 8   FOSTER   KY   41043-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   85.37 ACRES   196-299   NEAL JACK L & AMY J   HIPPLE MARLENA   101 CROWN AVE   FORT THOMAS   KY   41075-067-00-00-015.00   100 KM ACRES & HOUSE   100 KM ACRES & HOUSE   100 KM ACRES & HOUSE   100									
067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043           067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         36.344 ACRES & HOUSE & GARAGE         286-322         BIDDLE LORETTA & PAUL S BIDDLE									
067-00-00-012.00         105 ACRES         250-352         BOLD NORMAN & HUBERT NICKOSON         KAREN NELSON         13843 HWY 8         FOSTER         KY         41043           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         24 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-013.00         36.344 ACRES & HOUSE         286-322         BIDDLE LORETTA & PAUL S BIDDLE         724 LAKEVIEW LN         ALEXANDRIA         KY         41001-           067-00-00-015.00         36.344 ACRES & HOUSE         36.344 ACRES & HOUSE         BONAR DAVID B         14265 HWY									
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				l l					
	067-00-00-018.00	RAILROAD 10.951 ACRES	088-133	C & O RAILROAD			FOSTER	KY	41043

TABLE B-2
WELL INFORMATION WITHIN THE 1/4 MILE AREA OF REVIEW
CARMEUSE LIME & STONE
UIC PERMIT RENEWAL APPLICATION
CEC Project No. 141-515

API#	Surf_Elev	USGS_Quad	County	Org_Operator	Org_Wel_INo	Total_Depth	Org_Well_Class	Cmpl_Date	KGS_Permit	Rec_Lat27	Rec_Lng27	Rec_Lat83	Rec_Lng83
16191000020000	530	MOSCOW	PENDLETON	DRAVO LIME CO	BR92-1	633	MSC	1992-03-25	83005	38.835804	-84.23982	38.835872	-84.239755

TABLE H-1
SUMMARY OF ANALYTICAL DATA FROM INJECTATE - BLACK RIVER MINE
CARNEUSE LIME & STONE
UIC PERMIT RENEWAL APPLICATION
CEC PROJECT 141-515

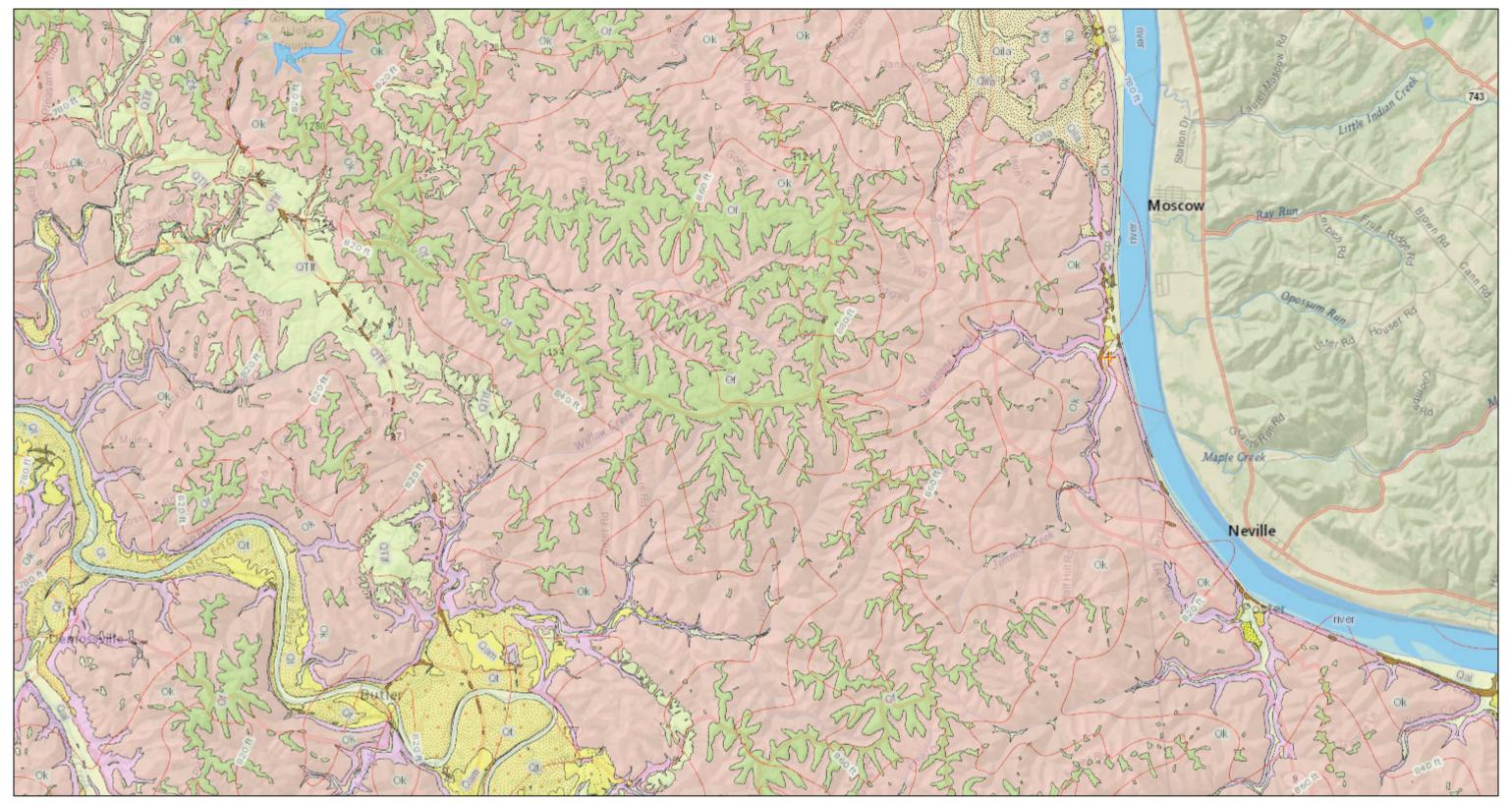
Parameter	Unit	Envirolime Slurry (9/9/08)	Thickner Underflow (9/10/08)
pH, Field	std	12.93	12.03
Total Dissolved Solids	mg/l	10360*	5562
Specific Gravity	SG(T/4C)	1.14	1.12
Barium, Total	mg/l	1.72	0.17
Calcium, Total	mg/l	1442.58	494.01
Iron, Total	mg/l	0.13	0.03
Magnesium, Total	mg/l	0.005	<0.002
Sodium, Total	mg/l	756.86	937.76
Alkalinity, Bicarbonate	mg/l	2805	755
Alkalinity, Carbonate	mg/l	<1	<1
Chloride	mg/l	1949.4	1379.6
Sulfate	mg/l	2290	993

<sup>\*-</sup>Total Dissolved Solids out of holding time when samples received by lab

	Environm	ental Permi	ts- Black I	River Ope	rations
Permit Type	Issuing/Reviewing Agency	Permit No.	Issued	Expires	Comments
Surface Disturbance					
Mining Permit	KY DSMRE	096-9401	6/23/2008	8/12/2009	
Explosives Permit	Office of Explosives & Blasting	7122388	12/14/2007	1/15/2009	
Explosives Permit	US ATF	4-KY-191-33- 9L-00706	6/18/2008	11/1/2009	
Air- Title V Permit	KY DAQ	V-05-003(R1)	9/26/2008	12/13/2010	
remiii	KY DAQ	C-84-116	7/27/1984	Expired	Superceded by Title V
Previous air		O-89-008 (Amended)			
construction /	KY DAQ KY DAQ	O-90-167	2/27/1991 1/3/1991	Expired Expired	Superceded by Title V Superceded by Title V
operation permits	KY DAQ KY DAQ	C-90-029 C-90-163	2/20/1990 10/10/1990	Expired	Superceded by Title V
J	KY DAQ	C-90-163 C-90-094	7/24/1990	Expired Expired	Superceded by Title V Superceded by Title V
SSMP	KY DAQ KY DAQ	C-85-167 N/A	11/21/1985 1/1/2006	Expired N/A	Superceded by Title V Startup Shutdown & Malfunction Plan
OMMP					
Water	KY DAQ	N/A	1/1/2006	N/A	Operations Maintenance and Malfunction Plan
Discharge	ICV DOW	1/2/00/45/00/4	44/4/0000	40/04/0044	KDDEC disabagga nagasit
Permit Water SPCC	KY DOW	KY0045284	11/1/2006	10/31/2011	KPDES discharge permit
Plan	Submit to KY DOW	N/A	6/18/2007	N/A	
Water BMP Plan	Submit to KY DOW	N/A	2/1/2007	N/A	
Water GWP	333333333333333333333333333333333333333		,		
Plan	Submit to KY DOW	N/A	6/14/2000	N/A	
Water Withdraw					Water withdraw permit I get renewed by
Permit	KY DOW	0886	6/22/1981	N/A	Water withdraw permit. Last renewed by request on 11-10-03.
UIC Injection					
Permit	US EPA UIC	KYV0003	8/22/2002	8/22/2007	Underground injection wells
UIC Injection Permit	US EPA UIC	KYV0002	8/22/2002	8/22/2007	Underground injection wells
Construction or	00 21 7( 010	141 7 0 0 0 2	0,22,2002	0,22,2001	Periodic Maintenance Dredging of Barge
Operation	US Army COE	No. 90-041	4/13/1990	N/A	Cleaning Area.
Construction or Operation	US Army COE	No. 90-109	7/25/1990	N/A	Mining under Ohio River.
Construction or	,	199801614-			
Operation Construction or	US Army COE	mkm	10/13/1998	N/A	Culvert maintenance
Operation Construction or	US Army COE	64-004	12/23/1964	N/A	Barge loading. River Cell Permit. Consolidate 69-005, 69-
Operation	US Army COE	No. 90-129	9/5/1990	N/A	002, 74-001, add temp coal unloading.
Construction or Operation	US Army COE	NO. F-90-172	10/10/1990	N/A	Barge loading, stone loading, coal unloading.
					Renew annually. Four cooler level indicators
Radiation Source	Key Cabinet for Human Resources	201-111-57	N/A	10/31/2008	in operation. Five on site. Kiln 2 not operating.
Permission Letter	CSX		5/10/1984	N/A	Overhead pipe bridge at 10930+82
Permission					
Letter	CSX Federal Communications	Call sign	3/19/1991	N/A	42" conveyor 2610' W of mile post 633
Radios	Commission	KTR978 Call sign	N/A	8/23/2005	
Radios		WPRF257	N/A	2/28/2005	Marine Radio License. No permit #
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-49-65	4/22/1965	N/A	Power line crossing Rt 8.
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-82-65	6/30/1965	N/A	Power line crossing Rt 8.
Encroachment	Ky Transportation Cabinet Dept.				•
Permit Encroachment	of Highways  Ky Transportation Cabinet Dept.	6-173-66	12/8/1966	N/A	2" water pipe under Rt 8.
Permit	of Highways	6-27-67	2/7/1967	N/A	Connect 48" culvert w/ existing culvert.
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-9-69	1/9/1969	N/A	Conveyor over Rt 8.
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-139-69	5/2/1969	N/A	Cross Rt 8 w/ primary distribution line.
Encroachment	Ky Transportation Cabinet Dept.				
Permit Encroachment	of Highways  Ky Transportation Cabinet Dept.	6-89-70	3/31/1970	N/A	Sewer line for mine dry.
Permit Encroachment	of Highways  Ky Transportation Cabinet Dept.	6-146-76	3/16/1976	N/A	Utility access.
Permit	of Highways	6-264-76	5/17/1976	N/A	Fence along Rt 8.
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-191-77	5/12/1977	N/A	Highway crossing
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-0026-94	1/26/1994	N/A	10" waterline across Rt 8.
Encroachment	Ky Transportation Cabinet Dept.				
Permit Encroachment	of Highways  Ky Transportation Cabinet Dept.	6-0049-95	2/3/1995	N/A	Realign existing access.
Permit	of Highways	6-0022-00	1/18/2000	N/A	Replace drainage pipe
Encroachment Permit	Ky Transportation Cabinet Dept. of Highways	6-137-64	12/8/1964	N/A	Conveyor under Rt 8.
Petroleum Storage and					
Containment	Kentucky State Fire Marshall				
Ohio Surface Mine Permit	Ohio Dept. of Natural Resources	IM-665	12/18/2001	6/24/2009	
				_	

# APPENDIX F AREA GEOLOGIC MAP

# Kentucky Geologic Map Information Service



1:72,224

0 0.75 1.5 3 mi

Kentucky Geological Survey
Content may not reflect National Geographic's current map policy.
Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

2.5

1.25

5 km

APPENDIX L
CONSTRUCTION DETAILS

Garth



September 22, 1994

William R. Mann United States Environmental Protection Agency 345 Courtland Street, N.E. Atlanta, Georgia 30365

Re: Black River Well #3

UIC Permit Number KYA0545

Completion Report

Certified Number - P 289 338 449 ...

Dear Mr. Mann,

To satisfy the completion requirements of Part I Section B Paragraph 4 of the above referenced permit, please find enclosed the following documentation:

EPA Form 7520-10

Also find enclosed the following to satisfy Part I, Section B:

Copy of the cement invoice Copy of the casing invoice

Operational check out of the injection well system is scheduled for October and full operation is scheduled to begin during the month of November.

Part I, Section D, Paragraph 3, requires injection fluid analysis and EPA Form 7520-11 to be reported annually. To comply with this provision, the first report will be submitted within one year of the date on which the well commences operation.

Thank you for your assistance with this project.

. Very truly yours,

Regina C. Henry

Engineer I

Enclosures

cc: Joel Strid

Garth Kuhnhein

File

9222 Springdale Road

Maysville, Kentucky 41056-9265

Phone: 606-564-9600

FAX: 606-564-9673

# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20480

Form Approved IMB No. 2040-3041 Approval empires 9-30-91

COMPLETION REPORT FOR BRINE DISPOSAL.
HYDROCARBON STORAGE, OR ENHANCED RECOVERY WELL

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	me Company				ime Company	MACH			
3600 One	Oliver Plaza	l			Dravo Lime Company 3600 One Oliver Plaza				
Pittsburgh, PA 15222-2682					Pittsburgh, PA 15222-2682				
			STATE	COUNTY	ALDES IN IJZZZ	The state of the s			
· LOCATE WELL	AND OUTLINE UNIT OF	4	KY	Pendleton		PERMIT NUMBER			
SECTION POL	T - 640 ACRES					KYA0545			
	N .		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ATION DESCRIPTION N/		ravanyos es			
1 1			40		14 SECTION	TOWNSHIP RANGE			
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	<del></del>			ACTIVITY	TYPE OF PERMIT	M407430, E2003010			
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W	<del>+                                    </del>	2				Estimated Fracture Pressure			
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1 1 1 .	1 1 1 !		-		of Wells				
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	5	<u>_</u>	Anticipated Da	ily Injection Pressure (PSI)	Denth to Ba	atiom of Lowermont Freehwater formation			
Winner to the same of the same		,	Average -0-	Maximum	(Feet)	3001			
Type o	of Injection Fluid /Check		Fresh Water	Lesse Name		Well Number			
	Liquid Hydrocarbon		X Owner			Black River Well #3			
- Inches	- 10. 1000000000000000000000000000000000			Mined Area		son Limestone			
ete Drilling Began		Date Well Car		Permaseriny of in	jection Zone				
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. Drilling Compa	Med		,	Porcerty of Inject	The second secon				
	August 15	5. 1994		3-17 61 11/000	N/A				
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00 Saa									
	Lunger - Grane -	Name or Disease	D			<del>7</del>			
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	40 78.6 1	lb/ft		Sectus	Class	Deptr			
20" Sch. 12" Sch.	40 78.6 1	lb/ft	611	Sectus	Class	Deptr   8n Dismeter   61'   24"			
20" Sch.	40 78.6 1	lb/ft	611	6 bags(pl	Cless ug) Type 1A G	Deptr   8n Dismeter   61'   24"			
20" Sch.	40 78.6 1	lb/ft lb/ft	626.5	6 bags(p1	Cless ug) Type 1A G	Deptr   8n Dismeter   61'   24"			
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20" Sch.  12" Sch.  4" Sch.	40 78.6 1 40 53.52 1 40 11.6 1	lb/ft lb/ft lb/ft	61' 626.5' 647'	6 bags(pl 300 bags (13 cu.yds	Type 1A Bu Type 1A Bu  WARE UNE LOGS	Deptr   8n Dismeter   61'   24"			
20" Sch. 12" Sch. 4" Sch.	40 78.6 1 40 53.52 1 40 11.6 1	lb/ft lb/ft lb/ft	61' 626.5' 647'	6 bags(p1 300 bags (13 cu.yds	Type 1A Bu Type 1A Bu  WARE UNE LOGS	Depart   St Diameter   61'   24"			
20" Sch.  12" Sch.  4" Sch.	40 78.6 1 40 53.52 1 40 11.6 1	lb/ft lb/ft lb/ft	61' 626.5' 647'	6 bags(p1 300 bags (13 cu.yds	Type 1A Bu Type 1A Bu  WARE UNE LOGS	Depart   St Diameter   61'   24"			
20" Sch.  12" Sch.  4" Sch.	40 78.6 1 40 53.52 1 40 11.6 1	lb/ft lb/ft lb/ft	61' 626.5' 647'	6 bags(p1 300 bags (13 cu.yds	Type 1A Bu Type 1A Bu  WARE UNE LOGS	Depart   St Diameter   61'   24"			
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20" Sch.  12" Sch.  4" Sch.	40 78.6 1 40 53.52 1 40 11.6 1	lb/ft lb/ft TIMULATION N/A	61' 626.5' 647'	6 bags(p1 300 bags (13 cu.yds	Type 1A Bu Type 1A Bu  WARE UNE LOGS	Depart   St Diameter   61'   24"			
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ROUTE 9 BOX 106-C Morgantown, WV 26505 (304) 291-0175

Sold To: DRAVO LIME COMPANY

3600 ONE OLIVER PLAZA

PITTSBURGH, PA 15222

Date SEPTEMBER 8, 1994

Purchase Order E-329

Invoice 502-356-2

Terms NET 30 DAYS

Description

**Amount** 

# BLACK RIVER DIVISION - 12" BOREHOLES, COMPLETION ESTIMATE

### TURN WATER BOREHOLE

Surface Drilling 61 Ft. @

Surface Casing 61 Ft. 8

Drill into Mine 561 Ft. @

Supply & Install 626.5 Ft. @ 12" Casing

Grout Casing to Mine 622 Ft. @

### IMESTONE FINES BOREHOLE

Supply & Install 4"
Slurry Line 647 Ft. 0

Demobilization (LS)

TOTAL DUE:



# Shaft Drilling . Water Wells . Turbine Pumps

### CROUTING DATA LIMESTONE FINES BOREHOLE DRAVO LIME - BLACK RIVER

### MOLE DIMENSIONS

Surface: 20" on x .375 Wall

2.02 On ft. X 61 ft. - 123 ou. ft.

Orillad Holer 15"

1.23 <u>cu.ft.</u> X 565.5 ft... 695.6 ou. ft.

Casing: 12 3/4 00

.89 Cu.ft. X 622 ft. - < 553.6 cu. ft.)

Estimated Annular Space:

265 cu. ft.

### Description

306 - 94 lb bags of grout were pumped 8/18 & 8/19/94 through 1" tremmie line from the bottom plate up to the surface.

305 - which yield 1.23 cu.ft. have a theoretical volumn of 363

co. It, which is more than the annular volume proving an effective grout scal.

# TABLE 1: WELL DATA

X.				
RECORD OF PLUGGING CONSTRUCTION DATE DRILLED LOCATION DEPTH OR COMPLETION ADDITIONAL INFORMATION	no wells in AOR	none none none	no wells in AOR	
RECORD OF PLUGGING OR COMPLETION	XXX	future well	N/A	dinates 8.4277
R DEPTH	XXX	640 ft. 640 ft. 640 ft.	N/A	Plane Coor , E 200258
LOCATION	XX	* * *	N/A	Kentucky State Plane Coordinates N 486072.6152, E 2002588.4277
DATE DRILLED	XXX	April 1, 1992 proposed well	N/A	
CONSTRUCTION	XXX	steel and cement steel and cement steel and cement	N/A	BLACK RIVER WELL Latitude: 38deg 50' 5.2" Longitude: 84deg 14'27"
DESCRIPTION	NO WELLS	DRAVO-BR Well #1 DRAVO-BR Well #2 DRAVO-BR Well #3	NO WELLS	NOTES: 1. * - Location of DRAV BLACK RIVER WELL #1 Latitude: 38deg 50' 5.2" Longitude: 84deg 14'27"
WELL TYPE	Producing Wells	Injection Wells	Abandoned Well	NOTES:

2. \*\* - Location of DRAV BLACK RIVER WELL #2 Latitude: 38deg 50' 33.3"

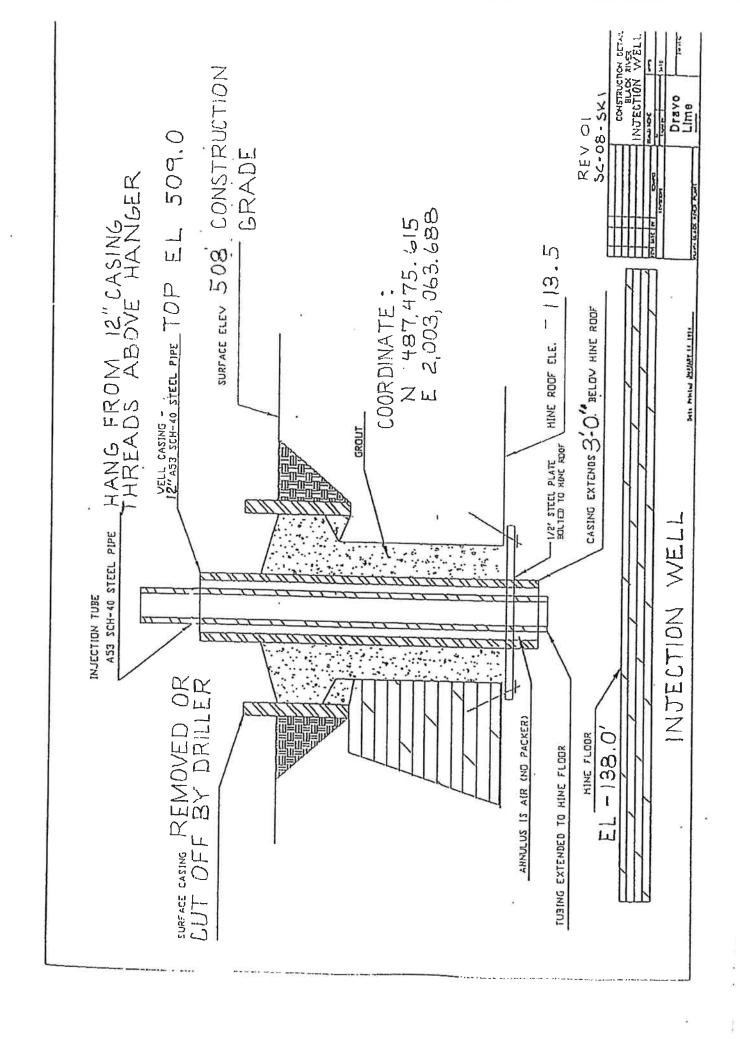
Kentucky State Plane Coordinates N 488910.1618, E 2002826.2541

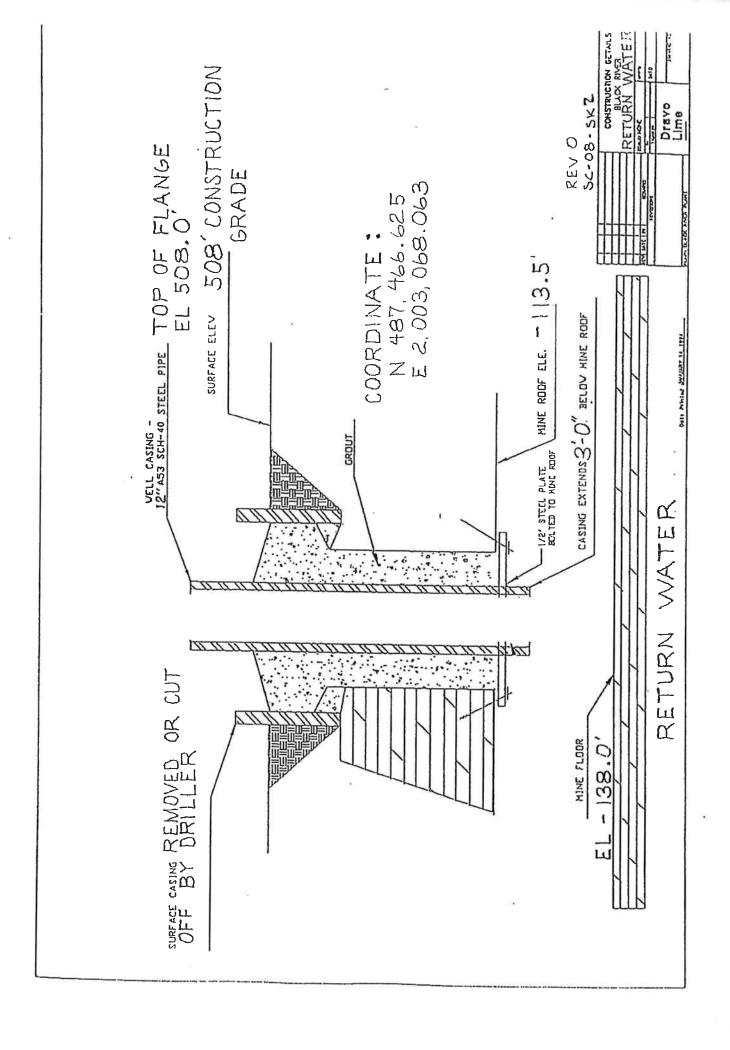
3. \*\*\* - Location of DRA --BLACK RIVER WELL #3 Longitude: 84deg 14' 23.7"

Kentucky State Plane Coordinates N 487450, E 2003010

Longitude: 84deg 14' 22" Latitude: 38deg 50' 19"

4. The proposed injection wells of DRAVO-BLACK RIVER will be constructed of steel pipe and grouted with cement.





## **APPENDIX R-1**

# RESERVED FOR: CARMEUSE LIME AND STONE FINANCIAL ASSURANCE STATEMENT